

Before the
UNITED STATES COPYRIGHT OFFICE

Library of Congress
Washington, D.C.

In the Matter of	:	Docket No. 2000-9
Digital Performance Right	:	CARP DTRA 1&2
in Sound Recordings and	:	
Ephemeral Recordings	:	

Testimony of ADAM B. JAFFE

I. INTRODUCTION AND BACKGROUND

A. Qualifications

1. I am a Professor of Economics and Chair of the Department of Economics at Brandeis University in Waltham, Massachusetts. Prior to joining the Brandeis faculty in 1994, I was on the faculty of Harvard University. During academic year 1990-91, I took leave from Harvard to serve as Senior Staff Economist at the President's Council of Economic Advisers in Washington, D.C. At the Council, I had primary staff responsibility for science and technology policy, regulatory policy, and antitrust policy issues. I have served as a member of the Board of Editors of the American Economic Review, the leading American academic economics journal. I am currently an Associate Editor of the Rand Journal of Economics

and a member of the Board of Editors of the Journal of Industrial Economics. I also serve as Co-organizer of the Innovation Policy and the Economy Group of the National Bureau of Economic Research.

2. I have served as a consultant to a variety of businesses and government agencies on economic matters, including antitrust and competition issues, other regulatory issues, and the valuation of intellectual property, including music performance rights. I have served as a business consultant and testified on behalf of both owners and licensees on the subject of the valuation and pricing of intellectual property such as copyrights. I am also the Chair of the Brandeis Intellectual Property Policy Committee. I have filed expert testimony and been qualified as an economic expert in a variety of regulatory, judicial, and arbitration proceedings. At Brandeis and Harvard, I have taught graduate and undergraduate courses in microeconomics, industrial organization, and the economics of innovation and technological change. A true and accurate copy of my curriculum vitae is attached as Appendix A.

B. Background and overview

3. I have been asked by a group of broadcaster streamers, webcasters, and background music services¹ to provide an economic analysis of issues related to valuation of the right of public performance of digital

¹ I use the term "broadcaster streamers" to refer to FCC-licensed radio broadcasters who simultaneously stream their over on-the-air programming on the internet. I use the term "webcasters" to refer to internet-only audio streaming businesses. I use the term

sound recordings and ephemeral recordings under 17 U.S.C. § 114(f)(2)(B) and 17 U.S.C. § 112(e) during the periods of October 1, 1998 to December 31, 2000, and January 1, 2001 to December 31, 2002. Section II provides a framework for my analysis. Sections III through V discuss the public performance of the sound recordings and relate only to broadcaster streamers and webcasters. Background music services are statutorily exempt from Section 114. Section VI, relating to ephemeral copies, applies to broadcaster streamers, webcasters, and background music services. In Section VI, I comment on the economic relationship between the value assigned to the Section 114 public performance right and the right of reproduction in the form of so-called “ephemeral” copies that is governed by Section 112(e).

II. FRAMEWORK FOR ECONOMIC ANALYSIS

A. Economic justification for a compulsory license/arbitration perspective²

4. From the perspective of economic analysis, the public policy motivation of a compulsory license/arbitration framework for a sound recording performance royalty derives from the underlying structure of the market for the public performance right. The nature of broadcasting is such that many or most broadcasters need permission for public performance from many distinct original rightsholders in order to produce and broadcast the

“background music services” to refer to businesses that provide background music primarily to business establishments.

² As discussed by Professor Fisher (Testimony of William Fisher), there has not historically been a public performance right in sound recordings.

kind of programming that listeners find most enjoyable. Further, the identification of the particular sound recordings that are going to be broadcast at a point in time is often decided only shortly before the broadcast and consequent public performance of the recordings. These two factors combine to create a situation in which a *competitive* market for public performance royalties for sound recordings may well be characterized by significant transactions costs, because negotiating agreements for the right of public performance with many different parties, often with uncertainty about what is going to be performed when and how often, would involve considerable time, inconvenience, and out-of-pocket costs.

5. In general, public policy seeks to encourage reliance on competitive markets, because such markets in most cases result in prices tied to costs, and prices that appropriately capture the value that buyers put on the good or service in question. But in a market in which a competitive structure would create large transactions costs, it may be advantageous to reduce those transactions costs by allowing centralized licensing of the right in question. Such centralized licensing permits broadcasters to license the rights that they need from a single party, and removes from the licensee the burden of determining, on a performance-by-performance basis, how to acquire the necessary performance rights.

6. This centralization of licensing of the right of public performance comes at a cost: the loss of the benefits of competitive pricing for

the right in question. A single party licensing performance rights on behalf of all or most owners of the rights in sound recordings will not license that right at a competitive price. Rather, such an entity can be expected to act as a monopolist, insisting on a fee for the performance license chosen to maximize the revenues received. In the language of economics, such a centralized licensor has "market power," which is the ability to elevate the market price above the competitive level.

7. Indeed, the high transactions costs that were the justification for centralized license administration make it likely that the monopolist licensor will have considerable market power, i.e., will be able to succeed in setting a monopoly price that is considerably higher than the competitive level. The ability of a monopolist to elevate the price is limited only by the possibility that too high a price will induce some potential buyers to forgo purchasing. In the case of a public performance right, a broadcaster has only three ways to avoid taking a license from a centralized licensor (in the absence of a compulsory license mechanism, which we will come to in a moment). First, the broadcaster could try to get the necessary rights from the individual underlying rightsholders, bypassing the centralized license administrator (assuming that the right of the centralized administrator to license the underlying works is non-exclusive). But the high transactions costs make this option unlikely to be economically viable for many broadcasters. Second, the broadcaster could infringe the copyrights, but such

an illegal option has to be thought of as either unavailable or very costly. Finally, the broadcaster can choose not to broadcast at all, thereby forgoing the overall economic value of their business. Since all of these options are expensive for many potential licensees, they impose only a mild discipline on a centralized license administrator who is not subject to any external pricing constraint.

8. Thus in the absence of a more interventionary public policy, markets of this type must either be hindered by high transactions costs, or else be burdened by monopoly prices that are likely to be far in excess of competitive levels. Compulsory licensing, with the terms and conditions set by arbitration, offers a solution to this dilemma. It offers the possibility of transaction-cost efficient centralized licensing, with terms and conditions of those licenses kept from monopolistic levels by the process of arbitration. I now turn to the particular statutory framework created to implement this approach for particular digital public performances of sound recordings.

B. The economic meaning of the willing-buyer-willing-seller/marketplace test

9. The statute specifies that the Copyright Arbitration Royalty Panel (the "Panel") is to determine license rates and terms "that most clearly represent the rates and terms that would have been negotiated in the marketplace between a willing buyer and a willing seller."³ The determination of the willing-buyer-willing-seller/marketplace rate should be

based on economic, competitive, and programming information, including certain specific criteria listed in the statute. I will discuss these specific criteria below. For the moment, I want to focus specifically on the economically appropriate interpretation of the willing-buyer-willing-seller/marketplace test that the statute specifies for the rates and terms that the Panel should establish.

10. The discussion in the previous section suggests that, from an economic perspective, the compulsory licensing/arbitration regime that the statute establishes has a specific economic and public policy motivation. It is designed to resolve the dilemma created by the existence of licensing transactions costs, i.e., the desire to reduce such costs through centralization, combined with concern that such centralization creates market power. Compulsory licensing combined with arbitration can resolve this dilemma: a centralized licensing authority can be authorized, to minimize transactions costs. An obligation to license under rates and terms subject to arbitration can then be used to ensure that the resulting rates and terms are kept to the competitive level.

11. Thus the economic and public policy interpretation of the compulsory licensing/arbitration regime suggests that the willing-buyer-willing-seller/marketplace test should be interpreted to mean that the Panel should set rates and terms that would prevail in a *hypothetical* market that

³ 17 U.S.C. § 114(f)(2)(B).

minimizes transactions costs while remaining competitive.⁴ After all, if Congress had considered it acceptable for a "market" rate to be one at the level a monopolist would set, it likely never would have created a compulsory license. If the law had simply created a right in the public performance of sound recordings by digital means, and left it entirely to users and rightsholders to negotiate terms, presumably they would have done so. The Recording Industry Association of America ("RIAA"), acting as a monopolist, would have insisted on a monopoly level for the rates, but would not have had any incentive to refuse licenses to users willing to pay that monopoly rate. In the end, we would have had "willing" buyers and a willing seller engaged in a "marketplace" transaction, and we would not have had to convene an arbitration panel to get that result. It simply makes no sense to think that Congress created a compulsory license and an arbitration procedure with the objective of reproducing the same result that would have occurred without those requirements. An interpretation of the willing-buyer-willing-seller/marketplace rule that did not ensure rates and terms at the competitive level would therefore be inconsistent with the statute's economic and policy motivation.

12. My interpretation of the economic and public policy motivation for the compulsory license/arbitration framework is strongly

⁴ The notion that the "marketplace" envisioned by the statute could be a hypothetical one is strongly suggested by the statutory language that governs here, which refers to "...rates and terms that *would have been* negotiated in the marketplace..." rather than "rates and terms that have been negotiated."

supported by the legislative history in this case. Normally, collective negotiation of license fees would potentially be subject to challenge under the antitrust laws, which are designed, among other things, to prevent monopolization. Section 114 *exempts* from antitrust laws collective negotiation of the statutory Section 114 license rates and terms, in order to allow the efficient centralization of the administration of the compulsory license. Congress specifically refused, however, to exempt from antitrust scrutiny collective negotiation of rates and terms of *other* licenses. This structure came about, in part, because of concerns on the part of the Department of Justice (DOJ) about avoiding the creation of monopoly power.⁵ Significantly, DOJ acceded to the centralization permitted by the statute in part because the review of rates and terms by an arbitration panel would

⁵ Congress specifically amended the antitrust immunity provision (Section 114(e)) refusing to shield collective fee negotiations from antitrust scrutiny in response to DOJ's concern that the prior proposed provision "could be read to provide statutory authority to record companies to form a licensing cartel. In light of the concentration of the record industry in which 6 major companies account for 80 to 85 percent of the U.S. market, this could, in the words of the Justice Department 'cause great mischief by allowing the formation of a cartel immune from antitrust scrutiny.'" Statement of Senator Patrick Leahy, Digital Performance Right in Sound Recordings Act of 1995, S. 227, Cong. Rec. S-11961. DOJ stated that it was "concerned that proposed subsection (e), by allowing license negotiations by a common agent, would authorize formation of a cartel by performance rights holders." Letter from Acting Assistant Attorney General Kent Markus to Hon. Patrick Leahy, June 20, 1995, reprinted in Cong. Rec. S11961 col. 3 - S11962 col. 1. DOJ recommended deleting section 114(e) altogether, arguing that record companies cannot "form a federally authorized cartel to set higher-than-competitive prices." Leahy Statement; Markus Letter.

After DOJ complained about the prior provision, it then "provided technical assistance to [Congress] as we worked out another approach that authorizes only a clearinghouse to cut down transactions costs without authorizing price fixing by combinations of companies." Leahy Statement. Once the provision was amended, DOJ gave approval, noting that "In the revised bill, the role of the common agent has been substantially curtailed, thus addressing our concern." It stated that now, "the common agent's role is limited to a 'clearing house' function" and that the agent "may not be the instrument of collective

operate as a check on the rates that might be demanded by the centralized licensing authority.⁶

13. Congress's intention to ensure competitive rates and terms is also illustrated by its requirement that the centralized licensing agency act only on a non-exclusive basis. By requiring non-exclusivity, Congress allowed for competition through individual direct transactions that can discipline the rates and terms demanded by the central licensing authority, for those users to whom or under those conditions where such "direct" licensing is economically feasible. The legislative history states that the purpose of this requirement was, indeed, to ensure that the rates and terms demanded by the licensing authority not be "supracompetitive," i.e., above the competitive level.⁷

14. The problem of mitigation of market power is handled in an analogous manner with respect to the licensing of the performance rights in musical works. In that arena, the major collective licensing organizations, the American Society of Composers, Authors and Publishers ("ASCAP") and Broadcast Music, Inc. ("BMI"), operate subject to Consent Decrees with the

⁶ negotiation of rates and material terms." Letter from Assistant Attorney General Andrew Foiss to Hon. Patrick Leahy, July 21, 1995, reprinted in Cong. Rec. S11963 col. 1.

⁶ "Any impasse on licensing fees, terms and conditions can be resolved by the rate panel, if necessary." Foiss, *op. cit.*, col. 1.

⁷ "The requirement of nonexclusivity is intended to preserve the possibility of direct licensing negotiations between individual copyright owners and operators of digital services, rather than merely between their common agents. For example, nonexclusivity should help prevent copyright owners from using a common agent to demand supracompetitive rates, because such demands might be avoided by direct negotiations with individual copyright owners." Cong. Rec., August 8, 1995, S.11954 cols. 1-2.

Department of Justice that resolved antitrust litigation against them. Under these Decrees, both organizations are constrained to offer licenses under specified terms, and at "reasonable" rates. The Federal Courts that administer the Decrees play a role analogous to this Panel, reviewing the rates demanded by the organizations if voluntary agreement cannot be reached. The Courts have interpreted the term "reasonable" to mean competitive market rates, precisely to prevent the exercise of what otherwise would be the market power of ASCAP and BMI.⁸

15. Thus, another way to state the conclusion that the statute requires that rates and terms be kept to the competitive level would be that the Panel should determine "reasonable" rates and terms. Indeed, the legislative history related to Section 114(f)(2)(B) observes that the Panel will "determine reasonable rates and terms" and that this process is "[c]onsistent with existing law."⁹ I will, therefore, for convenience, use the term "reasonable" to describe the rates and terms to be set by the Panel, by which I mean rates and terms consistent with those that would prevail in a competitive market.¹⁰

C. The use of benchmarks to determine the reasonable fee

⁸ *ASCAP v. Showtime/The Movie Channel, Inc.*, 912 F.2d 563 (2d Cir. 1990).

⁹ H. Conf. Rep. No. 105-796, 105th Cong., 2d Sess., at 86 (1998).

¹⁰ Professor Fisher's testimony discusses the meaning of the willing-buyer-willing-seller test from the perspective of the context of this statutory provision within the broader framework of copyright law, rather than from the perspective of economic analysis. This analysis from a different perspective reaches the same conclusion that I do, that is: that the statute calls for the Panel to choose a reasonable rate in the sense of the *Showtime* decision, namely the rate that would prevail in a competitive market.

level

16. As a matter of economic analysis, it is typically not possible to determine the reasonable or competitive fee level on the basis of the fundamental underlying costs and benefits. This fundamental indeterminacy of a reasonable fee is common with respect to the valuation of intellectual property, because the “cost” of providing that property to an additional user is essentially zero, while the “value” of the property to the user is inextricably interwoven with other components of the user’s product or service.¹¹ For these reasons, it is common—both in litigation and in voluntary commercial transactions—for royalties for the use of copyrights, patents, and other intellectual property to be established by reference to “comparables” or “benchmarks” rather than derived from explicit cost or value considerations.

17. For any possible benchmark, one must first determine whether the rate it presents can be presumed reasonable, since a benchmark that is itself unreasonable cannot be used to derive a reasonable rate. Second, one must determine the most economically appropriate metric or fee basis to be used in translating the reasonable fee in the benchmark context

¹¹ In the context of a collective licensing organization such as the RIAA, the fundamental determinants of the license price in a competitive market are the competitive value of all of the underlying individual sound recordings being licensed, plus the competitive value of the aggregation and brokering services that are performed by the centralized licensor. The difficulty of determining the fundamental value of the license derives from the difficulty of valuing the individual sound recording rights, in the absence of a healthy competitive market for those individual rights. If the value of the underlying rights could be determined, the fundamental competitive market value of the brokering/aggregation services could, in fact, be determined. In a competitive market, the value of that package of services would be just the cost of providing them, because competition among different

into a corresponding fee in the current context. Third, one must consider whether any adjustments would be appropriate to correct for relevant economic differences between the benchmark situation and the one at hand. Finally, one must consider how much weight to give to each benchmark, based on its overall economic significance and the relative reliability of any adjustments that may be necessary in each case.

18. The identification of suitable benchmarks in this case is made difficult by the fact that we are attempting to value a new form of intellectual property, in the context of a new performance medium. We cannot, therefore, appeal to direct historical experience. Any market transactions we might observe within this new medium are likely to have been in place for only a short period of time, and to be relatively insignificant in terms of actual royalties paid under them. Parties seeking to make those agreements *themselves* face the same problem we do: they have had no real benchmarks or comparables on which to base their judgment as to what is a reasonable royalty.¹² We would expect it to take some time before there is

entities to be the centralized licensor would drive the payment for those services to the level of cost (including a reasonable return on any necessary investment).

¹² In fact, proposed amendments to the ASCAP Consent Decree suggest that license fees negotiated by ASCAP and users in the first five years shall not be used as evidence of "reasonableness." See *United States v. ASCAP*, Civ. Action No. 41-1395 (WCC), Second Amended Final Judgment attached to Joint Motion to Enter Second Amended Final Judgment, at 13-14 (S.D.N.Y. March 16, 2001). The DOJ cautions that "music users are fragmented, inexperienced, lack the resources to invoke rate court proceedings and are willing to acquiesce to fees requiring payment of a high percentage of their revenue because they have little if any revenue." See *United States v. ASCAP*, Civ. Action No. 41-1395 (WCC), Memorandum of the United States in Support of the Joint Motion to Enter Second Amended Final Judgment, at 35 (S.D.N.Y. September 4, 2000).

enough experience with license transactions within this new medium in order for such transactions to reflect reliably a reasonable fee level.

19. Further, even in the presence of good information, there will always be a range of buyer "valuations" corresponding to potential users with varying perspectives, such as different ways of using the rights, differing perceptions of the importance to outside market and financial observers of having secured the rights, different levels of risk aversion and differing access to financial resources. Particularly in the shadow of an impending arbitration proceeding that will set the royalty rate for most users, the RIAA rationally would use its market power and identify those users with the highest valuations (for whatever reason) and try to reach agreement with them. But in a competitive market, the market price will not be determined by the valuation of a small number of users who place the greatest value on the service or product in question. Thus, even if these initial deals in the context of the new medium are in some sense between willing buyers and a willing seller, they are not indicative of the reasonable, competitive market rate. We are therefore unlikely to have available to us, for this nascent medium, demonstrably reasonable benchmark rates from transactions involving the rights and parties covered by Section 114(f)(2)(B).

20. Given this situation, we have two choices. We can rely on limited benchmarks which are from within the new medium but which are not likely to be reasonable, or we can turn to time-tested rates for closely

related rights in closely related media that provide evidence on the competitive rate level. The problem with the first approach is that it is very difficult to know what adjustments would be necessary to an unreasonable rate to render it reasonable. In contrast, by starting with a tested rate in a related context, considering a range of possible adjustments, and being conservative as necessary, we can produce a much more reliable indicator of the reasonable rate in the case at hand.

III. THE BENCHMARK FEE MODEL

A. Identifying a benchmark reasonable fee level

21. The licenses governed by Section 114(f)(2)(B) are for a particular right (public performance of sound recordings, subject to specified statutory restrictions) in a particular, specified medium (digital transmissions by non-subscription services). Ideally, we would like a benchmark that provides evidence regarding the reasonable rate level for a license that is similar along both of these dimensions.

22. Unfortunately, both dimensions present at least some difficulty in identifying benchmark situations that offer a solid foundation for an inference regarding the reasonable fee level. The particular right at issue – public performance of sound recordings – did not exist (or may be said to have existed at “zero value”) in the U.S. prior to 1995. Thereafter, U.S. copyright law created a limited public performance right for sound recordings, applicable (at least until quite recently) to relatively few users, that has a non-zero value. Hence, any available market experience with

valuing this right in the U.S. has been in place for only a limited time, has encompassed only limited economic activity and was itself negotiated in an environment where both parties had considerable uncertainty about the ultimate equilibrium value for the right.

23. For this reason, the best available starting point for a reasonable fee for the new public performance of *sound recordings* is the fee paid for the closely related public performance of *musical works*, rights which have enjoyed copyright protection for many years. The musical work is inextricably intertwined with the sound recording itself in producing the value of the public performance; in most cases, to make the performances at issue, a user needs both rights. Indeed, an argument can be made that any determination of the relative overall value of the two rights is inherently arbitrary.¹³ Use of a royalty rate for performances of musical works to infer a reasonable royalty rate for performance of sound recordings is the approach taken by the CARP that determined fees for public performances of sound recordings by subscription digital cable radio services under the Digital Performance Right in Sound Recordings Act of 1995.¹⁴ This approach was

¹³ As discussed further below, however, the idea that the *overall* value of the two rights cannot be distinguished does not imply that the royalty rate for the two should be the same. Because the promotional value of performances to owners of sound recordings is greater than the promotional value to composers and publishers, equality of the overall value of the two rights implies that the *royalty* rate on sound recordings should be lower.

¹⁴ See discussion in Librarian of Congress Final Rule and Order, 63 Fed. Reg. 25394, 25404 (May 8, 1998); see Report of the Copyright Arbitration Royalty Panel, Docket No. 96-5 CARP DSTRA, at ¶ 197-202 (November 28, 1997).

also adopted by the Copyright Board of Canada.¹⁵

24. The digital cable radio CARP determined the sound recording rate on the basis of performance rights fees paid by certain digital cable radio licensees to the performing rights collectives that license musical works.¹⁶ In the current context, the streamers are, in most cases, still in negotiation with ASCAP, BMI, and SESAC over license terms. While some streaming entities may have agreed to licenses for the performance of musical works, the vast majority of significant licensees have not. Hence we do not have available as a starting point a good base of a reasonable fee for performance of musical works within the internet medium.¹⁷

25. It is possible, however, to identify a well-established benchmark fee for performance of musical works in a closely related media context. Over-the-air broadcast radio has paid royalties for the right of public performance of musical works for over half a century. Over the decades, these royalties have been the subject of numerous negotiations between the

¹⁵ See Decision of the Copyright Board of Canada, Public Performance of Sound Recordings 1998-2002, August 13, 1999, at 30-32.

¹⁶ While I believe that the musical works marketplace can be a reasonable benchmark for setting rates for performances of sound recordings, in my judgment the small number of licenses used as a benchmark rate in that case was subject to grave questions about their reasonableness, especially given the newness of the media context (as discussed above). Indeed, the reasonableness of the rates in the musical works performing licenses that formed the basis of that CARP decision are currently being challenged in the BMI Rate Court by the users who had originally signed those musical works licenses.

¹⁷ As discussed further below, ASCAP and BMI have, in the internet setting, insisted on royalty formulas based on the licensee's revenue, subject to a minimum fee. If any streamers have accepted these licenses, it is likely that many are paying at the minimum fee level because streamer revenues are so low. It would be difficult to draw reliable inferences about the value of these rights from payments made at the minimum fee level.

over-the-air broadcasters and the organizations that represent composers and music publishers, ASCAP, BMI, and SESAC. In recent years, hundreds of millions of dollars have been paid every year by thousands of individual licensee stations to secure these rights.

26. The over-the-air musical work performance royalties experience is thus of great overall economic significance. In considering whether these rates are likely to be reasonable (consistent with a competitive market), we must consider the likelihood that ASCAP, BMI, and SESAC have market power for the reasons discussed above. Although there are three "centralized" licensors, they do not provide significant competitive discipline on one another, because most broadcasters need licenses from all three in order to operate. Hence, for all the reasons discussed above, in the absence of policy intervention, these collectives would be likely to exact fees significantly in excess of the reasonable level. However, the Consent Decrees under which ASCAP and BMI operate are designed to ensure that reasonable fee levels are maintained.¹⁸ What this means is that if ASCAP or BMI attempts to insist on unreasonable fee levels, licensees have the option of invoking the Rate Court mechanisms to limit the rates to reasonable levels. Of course, use

¹⁸ Under the terms of the ASCAP Consent Decree, an ASCAP licensee can apply to the U.S. District Court that supervises the Decree for a determination of a reasonable rate. See *United States v. ASCAP*, 1950-1951 Trade Cas. (CCH) ¶ 62,595 (S.D.N.Y. March 14, 1950)(amended final judgment). This review mechanism is commonly referred to as the "ASCAP Rate Court." A "BMI Rate Court" was created in 1994, although even before that time BMI operated under the terms of a Consent Decree with the Justice Department. See *United States v. Broadcast Music, Inc.*, 1966 Trade Cas. ¶ 71,941 (S.D.N.Y. 1966), decree modified, 1966-1 Trade Cas. ¶ 71,378 (S.D.N.Y. 1994).

of the Rate Court is costly, and the outcome is potentially uncertain, so we would expect that observed fees for ASCAP and BMI would be somewhat in excess of the reasonable level. Nonetheless, the fees paid to ASCAP and BMI may be viewed as constituting an upper bound on the reasonable fee rate. Fees paid to the third organization, SESAC, are not disciplined by a Rate Court mechanism, and therefore cannot be presumed to be reasonable. Though SESAC fees amount to only a small fraction of overall fees, they provide an additional reason why the true reasonable fee level for all musical works combined is below the level of the aggregate fees paid to ASCAP, BMI, and SESAC.

27. Having established that the over-the-air musical work right provides a strong basis for determining an upper bound on the reasonable fee, I must now consider how that fee can be reliably translated into an economically equivalent reasonable fee for the current proceeding. I proceed in two steps. First, I will express the over-the-air musical work fee in a way that is directly transferable from the over-the-air setting to other settings, including internet transmission. Then, I consider the economic relationship between a reasonable fee for performance of musical works and a reasonable fee for sound recording performances. All available evidence indicates that, all else equal, the right at issue in this proceeding should command a lesser performance royalty than the musical work performance right licensed in the benchmark setting. Although it is not possible to specify the exact magnitude

of the discount that should be applied to the benchmark fee level to derive a reasonable fee level in this setting, I identify a range of possible discounts that would be consistent with the available evidence.

B. Measuring the fee level in the benchmark setting

1. Determining the economically appropriate fee basis

28. In order to determine the appropriate way to translate the fees paid by over-the-air radio stations into an appropriate fee in the internet context, it is important to start from a sensible economic model of the nature of the right being licensed. It is a right of public performance. Hence it seems reasonable that the fees paid should, in some general sense, be proportional to the number of performances. Now, there is some ambiguity as to what constitutes a "performance," in particular whether it is a single song, or some given period of listening time. But clearly, the more different people that listen to a given stream of music, the more performances are occurring.¹⁹ Hence, what I would like to know is the appropriate value of one public performance, meaning one person listening to continuous music for some fixed period of time, or, alternatively, one person listening to the performance of a single song. If I can construct a reasonable royalty rate for one listener hearing one hour of music, or one listener hearing one song, that rate can then be multiplied times the number of hours (or songs) broadcast,

¹⁹ Equivalently, we can think of there being a single performance at a moment in time that is heard simultaneously by many people. Under such an interpretation, the value of the performance is clearly proportional to the number of people who hear it.

and by the average number of listeners tuned in to each hour, to produce an aggregate reasonable royalty fee for a licensee.

29. Thus, the most economically sensible way to construct a reasonable fee model for a public performance license is to define the reasonable fee on a listener-hour or listener-song basis. If reasonable fees are constructed in this manner, they can reasonably be adapted from one broadcast medium to another, so long as the nature of the performances themselves is reasonably similar. That is, if I knew that the reasonable value for the right of public performance of a copyrighted work to one listener hearing one hour of over-the-air-radio is $X\phi$, it is reasonable to presume that the same rate should apply for the same right over the internet, so long as the nature of the performances is similar.

30. Structuring the benchmark on a listener-hour or listener-song basis has several desirable characteristics. First, because the fees are tied in a fundamental way to the volume of performances, the fee will vary across licensees, and will change over time for a given licensee in a very intuitive way. Streamers with more listeners will pay more in royalties; streamers with fewer listeners will pay less. Currently, streaming is in its infancy. The number of listeners is quite small, but is increasing over time. As the technical potential of streaming is more fully realized, and listeners become more accustomed to using the internet to listen to music, listenership will grow further. A listener-hour or listener-song model will automatically

generate a proportional increase in royalty payments.

31. Second, listener hours or listener songs form a basis for royalty calculation that is *directly* tied to the nature of the right being licensed, unlike other bases such as the revenue or programming expenditure of the licensee. Indeed, these other bases are fundamentally only proxies for what we really should be valuing, which is the performances. And the use of proxies such as revenue, particularly in the context of a diverse and fluid environment such as the internet, creates enormous potential measurement problems. How would one determine the revenue associated with streaming activities? Many websites have a streaming and non-streaming component, and individual streamers have made different decisions about how to structure their websites.²⁰ Should a streamer with many listeners but no revenue pay a zero or minimum fee, while another streamer with few listeners that generates significant revenue (perhaps from users who do not listen to music) pays much more? A fee based on listener hours or listener

²⁰ Streamers note a number of significant non-streaming features of their sites: artist interviews and promotional events (Testimony of David Goldberg, Launch Media Inc.; Fred McIntyre, Spinner Networks Inc.; Robert Ohlweiler, MusicMatch; Steven McHale, Everstream; David Pakman, myplay), artist discographies and biographies (Testimony of Michael Wise, NetRadio; Charlie Moore, RadioAMP), "chat rooms" where listeners can interact to share musical interests (e.g., Testimony of Rob Reid, Listen.com; David Goldberg, Launch Media, Inc.; Testimony of Tuhin Roy, Echo Networks Inc.), calendars of events (e.g., Testimony of Dan Halyburton, Susquehanna), and pictures from live performances (e.g., Testimony of Dan Halyburton). Listeners to broadcaster streamers may visit the stations' website to obtain information about the station and local news, sports, weather and community events (e.g. Testimony of Stephen Fisher, Entercom). Many stations maintain websites, some with related music features and promotions, but do not stream at all (e.g. Testimony of Dan Mason, CBS/Infinity). Also, as discussed in the Testimony of Michael Mazis, 40% of visitors to streaming websites did not listen to any music in their most recent visit to the site.

songs is an objective formula which avoids all of these measurement problems, while causing the fee to vary in connection with what should cause it to vary—the extent of public performances.²¹

32. Finally, listener hours are relatively easy to measure on the internet. As discussed further below, some services have ratings data produced by Arbitron or other commercial enterprises. Additionally, as explained in the Testimony of Professor Jonathan Zittrain, there is a close relationship between the number of listener hours and the amount of “bandwidth” that a streamer must purchase. Since bandwidth is a key cost input of a streamer’s operation, and listener hours are tied to bandwidth, many streamers can or do compute listener hours independent of any need to do so for royalty calculation purposes.²²

2. Estimating the musical work public performance royalty in over-the-air radio

33. Based on the analysis in the previous sub-section, the fee paid per listener hour or per listener-song for the right of public performance of musical works on over-the-air radio is a good benchmark for a reasonable fee for public performance of musical works on the internet, so long as the nature of the performances on over-the-air and internet radio services is similar. Indeed, the nature of the performances is quite similar, within

²¹ The digital cable radio CARP adopted a royalty model based on a percentage of revenue. To my knowledge, the Panel was not presented with data that would have permitted construction of a fee on a listener-hour or listener-song basis.

programming formats.²³ First, broadcaster streamers are streaming the same programming over the internet as they broadcast over the air, so a listener receiving one or the other is getting a nearly identical performance. Even for webcasters, the nature of the performances is qualitatively very similar. It is typically a mixture of albums, other pre-recorded music, and perhaps some live performances. In some cases, the number of performances per hour may differ, both across different over-the-air stations and across different streamers. But the implications of this variation in the *number* of performances per hour are easily dealt with in a listener-hour or listener-song model, as discussed below. In terms of the performances that do occur, it is reasonable to treat the value per performance or performance period for a given listener as reasonably equivalent.

34. Thus, I can construct an estimate of the reasonable fee for the public performance of a musical work on the internet from the fees paid by over-the-air radio stations for that right. As discussed above, the reasonable royalty for *that* right is an upper bound on the reasonable royalty

²² One reason that revenue is often used as the basis for royalties in intellectual property agreements is that it is relatively easy to measure. In the particular case at hand, we have a better basis that happens to be also quite easy to measure.

²³ In radio, and potentially on the internet, some stations broadcast primarily talk and others broadcast primarily music. Obviously, when talk is being broadcast, there would typically not be a public performance of music occurring. If such stations do broadcast some non-incidental music, then the nature of the public performance that occurs when that song plays is similar to the performance that occurs when a music station plays a song. Hence, on a per-song basis, the performances on all radio stations and streamers are reasonably similar. On a per-hour basis, a talk station may reasonably be considered to be making fewer performances per hour, because most of what is broadcast is not music. This difference between talk and music stations is considered below.

for the public performance of the sound recording. I will discuss below what adjustments to this upper bound are appropriate to arrive at the reasonable sound recording fee.

35. In developing the over-the-air license royalties on a per-listener basis, the starting point is data on the aggregate fees paid to ASCAP, BMI, and SESAC by over-the-air radio stations holding blanket performance licenses.²⁴ This blanket license entitles the music user to use any musical work in the performing rights organizations' repertoires for a fee that does not vary directly with the amount of music that is actually performed. For typical music stations, which broadcast a substantial amount of music in most programs, the volume and diversity of their music use would make it economically infeasible to acquire the rights for all of this music directly from the underlying rightsholders; thus, the blanket license is the desired license form. Accordingly, a benchmark constructed on the basis of a sample of blanket-license radio stations is appropriate for services that stream primarily music on the internet.

36. Combining the fee information with data on the "ratings" or listening audience of these stations, I can convert the over-the-air music stations' fees to ASCAP/BMI/SESAC into an average fee paid by an over-the-

²⁴ These license fees were based on license formulae derived from the "net revenue" of the radio stations. As discussed above, however, a percentage of revenue model is at best a proxy for the value of the performances themselves. The revenue formula is a means to an end, where the desired end is a reasonable value for the performance right. What I am assuming is that this proxy does a reasonably good job *within* broadcast radio, producing

air broadcaster per "listener hour." The steps of this calculation are: (i) start with total fees; (ii) divide by the number of hours of broadcasting; and (iii) then divide by the average number of listeners in a given hour. This produces a fee that is paid on average for a single listener tuned to a station for a single hour. This "listener-hour" fee could then be applied to an internet streamer by multiplying it by the number of hours of music streamed and the average number of listeners. This will produce a fee for that streamer that is identical to what would be paid, on average, by an over-the-air broadcaster with the same number of listeners and the same number of music hours broadcast. For other services, the fee will vary in direct proportion to the number of listeners and the number of hours of music broadcast.

37. This listener-hour fee (after adjustment for differences between the benchmark musical work performance right and the sound recording performance right at issue here, as discussed further below) can be used to calculate a reasonable fee for any internet service that streams primarily music. The royalty owed would be the adjusted listener-hour fee times the total aggregate tuning hours ("ATH") for the streamer. ATH is a measure widely used on the internet that represents, in effect, the average number of listeners times the number of hours broadcast.

38. The listener-hour fee represents the average amount paid by radio stations utilizing the blanket licenses of the performing rights

fees that are roughly proportional to listener hours. Indeed, in the over-the-air fee data

organizations. Though the stations used to calculate the benchmark fee utilize formats that are primarily music, there is some variation in the number of songs per hour. Under the ASCAP, BMI, and SESAC licenses, these moderate variations in the number of songs per hour do not generate any differences in the fees paid. Hence, it is reasonable to treat the blanket license fee as insensitive to the actual number of songs played, as long as we are talking about streams that consist primarily of music performances for which a fee obligation is owed to the sound recording copyright owners.

39. It is also desirable to have a license option that is not a “blanket” license. Such a non-blanket license serves two important purposes. First, it is important to have a reasonable license option for streamers that have significant amounts of non-music programming. Clearly, such a streamer is generating fewer music performances per hour, and hence should pay a fee that is reduced in proportion to the non-music parts of the stream. Second, it is also important to structure the license regime in such a way so as to facilitate, to the extent it is economically feasible, the licensing directly from the individual rightsholders of segments of the streamer’s music use. That is, while it is likely to be the case that many users prefer to have a blanket license and thereby not need to worry about whose sound recordings they are using, some users may use (or wish to adopt conscious strategies to utilize) primarily music for which no further permission is needed, or music

discussed below, this assumption is borne out.

for which the permission can be acquired directly from the individual rightsholders. A good existing example of such a licensee is Comedy Central, which streams comedic content on its Comedy Central Radio service. A substantial amount of that content is owned by Comedy Central itself (having been commissioned on a for-hire basis for Comedy Central's cable television program service).²⁵ Thus, if the license offerings resulting from this proceeding were limited to a "blanket" license, priced to correspond to streamers that need to purchase the sound recording performance rights for most of the material they stream, Comedy Central would implicitly be paying for the right to stream sound recordings that it owns itself.

40. Further, facilitating licensing transactions whereby licensees acquire performance rights directly from the underlying rightsholders will encourage the development of a competitive market in such "direct" licenses.²⁶ If such a competitive market could develop, it would provide an additional mechanism for ensuring that overall fees are kept to the reasonable level.²⁷

41. Streamers that have significant non-music programming, or that have licensed a significant fraction of their music programming directly from individual owners of the performance rights, should be accorded

²⁵ See Testimony of Joe Lyons, Comedy Central.

²⁶ See *United States v. ASCAP*, Civ. Action No. 41-1395 (WCC), Memorandum of the United States in Support of the Joint Motion to Enter Second Amended Final Judgment, at 35 (S.D.N.Y. September 4, 2000).

a license form that takes into account both of these situations. One mechanism for doing so would be to adopt the listener-hour approach discussed above, and apply it only to that percentage of the licensee's listener hours that requires a statutory license. Under this segmented-listener-hour model, Comedy Central, for example, would pay a fee calculated on the basis of its listener hours, reduced by the percentage of streamed hours that are occupied by recordings it created and owns or has otherwise secured the rights to, or that do not contain sound recordings.

42. Alternatively, one could calculate the royalty on a "listener-song" basis. That is, rather than charging on the basis of total listener hours (as in the listener-hour model), or on the basis of the percentage of listener hours in which non-direct-licensed sound recordings are being streamed (as in the segmented-listener-hour model), this alternative would charge on the basis of the number of non-direct-licensed songs that are streamed. As with both of the other models, the fee would maintain the element of average listenership, so that the license fee will increase as more people tune in.²⁸

43. The reasonable fee level for the listener-song model can be

²⁷ Indeed, as discussed above, Congress insisted on *non-exclusive* centralized licensing precisely to facilitate direct licensing as a check on supracompetitive license rates.

²⁸ The alternative to the blanket license in the ASCAP/BMI over-the-air radio world is a "per-program" license. This license allows the licensee to avoid a royalty obligation for entire programs that are free of music bearing a royalty obligation. This approach is less desirable than the listener-song model described herein, because licensees receive no benefit for direct-licensing or otherwise eliminating fee obligations until an entire program is purged of fee obligations. See *United States v. ASCAP*, Civ. Action No. 41-1395 (WCC), Second Amended Final Judgment attached to Joint Motion to Enter Second Amended Final Judgment, at 13-14 (S.D.N.Y. March 16, 2001).

readily calculated from the same information on ratings and fees used to calculate the listener-hour fee, in conjunction with information on the number of songs broadcast per hour on radio programs in different programming formats. That is, the fee per listener hour can be converted to a fee per listener song by dividing it by the average number of songs played per hour.

44. I do not suggest that the segmented-listener-hour or listener-song approaches discussed immediately above be made available to all licensees. A possible problem in giving licensees the unrestricted option of choosing between such approaches and the blanket per-listener-hour fee is that licensees might "self-select," resulting in a situation (to the copyright owners' detriment) where those licensees with the most songs used would choose the listener-hour fee while those with the fewest songs would choose the segmented-listener-hour or listener-song fee. If this happened, the overall average fee would be lower than in the benchmark universe in which all music-format stations utilize the blanket fee, regardless of how many songs they stream per hour.

45. To prevent this outcome, it would be appropriate to reserve the segmented-listener-hour and listener-song licenses for those streamers that have statutory license obligations for content or songs per hour that is below the range of the over-the-air blanket-license radio stations that form the basis of the listener-hour fee rate. Candidates for the segmented-listener-

hour or listener-song models could achieve this status either because their format contains less music overall or because (as in the Comedy Central example) direct licensing of the rights involved eliminates the streamer's obligation to pay for much of their content. Use of these models can be restricted to the appropriate candidates by allowing only streamers that have no more than a designated amount of non-direct licensed content or songs per hour to utilize the segmented-listener-hour or per-song fee structure.

3. Description of data and calculations

46. In order to implement the calculations described above, I needed data on the fees paid to the performing rights societies by the over-the-air broadcasters, on the associated listeners, and on the average songs per hour. There are no publicly available sources of data that I am aware of that provide the total license fees paid by the over-the-air broadcasters as a group to the performing rights societies. The over-the-air radio licenses are signed by the stations directly with ASCAP, BMI, or SESAC. Since there is no centralized source of this fee data, I collected data for a subset of stations in order to implement the model.

47. I have collected data from several of the largest radio groups including ABC, Inc., Bonneville International Corporation, CBS Broadcasting, Inc., Clear Channel Communications, Inc., Crawford Broadcasting Company, Emmis Communications, Entercom Communications Corporation, Salem Communications Corp., and Susquehanna Pfaltzgraff

Co./Susquehanna Radio Corp. These broadcasters include many of the largest radio stations in the United States, and the aggregate fees that form the basis of my calculations represent a significant portion of the total fees paid to the performing rights organizations by over-the-air radio stations. Altogether, my calculations utilize data from approximately 900 "blanket" stations that paid over \$143 million in annual fees to ASCAP, BMI, and SESAC.

48. From each broadcaster, I requested total performing rights fees paid by stations in 2000. I used data from all over-the-air, blanket-license broadcasters for which I was able to get Arbitron ratings data.²⁹ Arbitron is a firm that is relied upon by many industry participants for measurement of radio audiences.³⁰ These data are frequently relied upon by stations and advertisers when determining advertising rates. Arbitron measures radio audiences using a complex survey that is designed specifically for measuring radio ratings.³¹ One of the measures of audience size that Arbitron provides is "average-quarter-hour persons" ("AQH

²⁹ Details on the construction of the database, and descriptive statistics of the data, are provided in Appendix B to this report.

³⁰ Arbitron is an international media and marketing research firm serving radio and TV broadcasters, cable companies, advertisers and advertising agencies, magazines, newspapers, and the online industry in the U.S. and Europe. Arbitron's market research to evaluate America's radio listening patterns has been relied on by radio stations, advertisers, and agencies in the U.S. since 1949. See *Ceridian Corporation, Company Overview*, Market Guide Inc., April 1, 2001.

³¹ See The Arbitron Company, *Arbitron Radio Description of Methodology: Radio Market Reports*, at i (2000).

persons"),³² listening audiences for hundreds of radio stations. These AQH persons are converted into total listener hours for each station, as described in Appendix B. By dividing the total performing rights fees paid by this estimate of total listener hours, I was able to calculate the actual fee paid per listener hour for each station.

49. To calculate a fee per listener song, I need an estimate of the number of songs per hour on each station. Although I do not have actual programming information for each station, I do have a standardized programming format for each station. Data are available from Broadcast Data Systems (BDS) on the average number of songs per hour for music-intensive formats.³³ Given the fee per listener hour and an estimate of the number of songs per hour, the fee per listener song is constructed by dividing the listener-hour fee by the number of songs.³⁴ The precise calculations underlying the fee per listener song are described further in Appendix B.

50. The result of these calculations (before any adjustment for differences between the musical work performance right and the sound recording performance right at issue here) is a fee per listener hour of approximately \$0.0022. The fee per listener song is approximately

³² Arbitron defines AQH Persons as "The average number of persons listening to a particular station for at least five minutes during a 15-minute period."

³³ For example, Adult Contemporary stations averaged 11.22 songs per hour, while Spanish music stations averaged 7.08 songs per hour. BDS is a leading provider of off-the-air music recognition for the record and radio industries. BDS uses a computer technology to monitor radio broadcasts and to determine what songs are played on the air.

\$0.00020.³⁵

IV. ADJUSTMENT OF THE BENCHMARK FEE FOR MUSICAL WORK PERFORMANCES IN ORDER TO DETERMINE A REASONABLE FEE FOR THE SOUND RECORDING PERFORMANCES AT ISSUE HERE

A. Conceptual basis for a discount to the musical work performance royalty

51. The previous section explained the derivation of a benchmark starting point for a reasonable sound recording performance fee, based on over-the-air performance fees for musical works. On a fundamental level, it is difficult to determine the relative value within a public performance of the underlying musical work and the sound recording itself. Both are essential. On an anecdotal basis, one can identify particular musical works that clearly have value that transcends that of any particular sound recording of that musical work; conversely, one can identify individual sound recordings whose value transcends that of the musical work being rendered. From an economic perspective, there does not seem to be any basis for saying that the “true” value of one or the other is greater.³⁶

³⁴ Ultimately, what I care about is the *average* fee per listener song, not the specific fee paid by any single radio station, so there is no significant loss of precision associated with using format averages for the number of songs per hour.

³⁵ Because the musical works fee formulae are tied to net revenue, and revenue depends generally on listening audience, there is a reasonable degree of consistency in the fee per listener hour across different over-the-air stations. The only systematic pattern of variation that I have discerned is that the fee per listener hour tends to be slightly higher in larger broadcast markets. The proportion of stations from such markets in the data is higher than the proportion in the overall universe of stations. This means that the fee estimates that I have calculated overstate the true average fees per listener.

³⁶ See Report of the Copyright Arbitration Royalty Panel, Docket No. 96-5 CARP DSTR, at ¶ 169 (November 28, 1997). See also Decision of the Copyright Board of Canada, Public Performance of Sound Recordings 1998-2002, at 30-32 (August 13, 1999).

52. Although it is not possible to distinguish the relative values of the musical work and the sound recordings themselves, this does not mean that the specific *performance right* licensed by ASCAP, BMI, and SESAC cannot be distinguished in value from the *performance right* at issue here. Indeed, there are several reasons why the benchmark ASCAP/BMI/SESAC royalty is likely to be greater than the reasonable sound recording performance royalty at issue here, both as a general proposition within the competitive markets framework and on the basis of the specific statutory criteria enumerated in Section 114(f)(2)(B):

- The ASCAP, BMI, and SESAC fees that compose the benchmark are above the reasonable rate because of the market power of those entities.
- The promotional value of public performances or “airplay” by broadcasters and streamers is significantly greater to the owners of sound recording copyrights than it is to the owners of the musical works copyrights.
- The technological contribution of the streamers is significantly greater than that of the rightsholders.
- The capital investment of the streamers is significant, and there is significant doubt regarding their ability to recoup these investments with reasonable returns.
- The risks currently faced by the streamers far exceed the risks faced by the rightsholders.
- The costs borne by the streamers, relative to their likely revenues during the license period, are much greater than the costs of the rightsholders relative to their overall revenues.
- The legal right conveyed by Section 114(f)(2)(B) is limited in ways that diminish that right’s value, at least for some streamers.

I will now discuss each of these points in more detail.

53. *Market power of ASCAP, BMI, and SESAC.* As discussed above, the organizations that offer blanket performance licenses for musical works have market power because many broadcasters have no realistic alternative to the licenses they offer. In the case of ASCAP, this is disciplined by the possibility of appeal to the ASCAP Rate Court, but this means only that the ASCAP fee cannot exceed the reasonable level by more than an amount that corresponds to the cost and risk of a licensee initiating a Rate Court proceeding. The situation with BMI is similar, with the added factor that the fees paid by the stations to BMI for the period 1997-2001 are, in fact, being contested by the stations, providing further indication that they are above the reasonable level. As to SESAC, there is no rate court option. Although SESAC provides only a small portion of the fees (because of the small repertoire that it controls), it is likely that this fee component is above the competitive level because broadcasters' only alternative to a SESAC license is to try to purge their programming of SESAC music. In effect, SESAC is large enough to make it difficult to broadcast without it, while small enough to apparently avoid Justice Department scrutiny.

54. *Promotional value.* Whatever the underlying or fundamental value of a musical work or a sound recording, the competitive market royalty for the right of public performance of each would be affected by the promotional value created by that performance. From an economic

perspective, we would expect that the *total consideration* provided by a licensee to the owner of a performance right would approximately correspond to the "value" of a performance of the underlying musical work or sound recording. But that "consideration" does not come only in the form of a royalty paid. Typically, a broadcast public performance also provides benefit to the owner of the underlying musical work or sound recording by stimulating sales of albums and other fixed media containing the work being performed.³⁷ Thus the "total consideration" that is likely to correspond to the value of the performance of the underlying musical work or sound recording is the *sum* of two components: a royalty paid *plus* the promotional value delivered.

55. This analysis suggests that, even if the fundamental value intrinsic to performances of musical works and sound recordings were equal, the reasonable fee levels paid by licensees for the right of public performance would not necessarily be the same. If one or the other of these enjoys a greater promotional benefit, it would generate a lower reasonable royalty fee in order to produce the same total of fee plus promotional value in both cases.

56. As discussed further below, when public performances

³⁷ As Professor Fisher notes in his testimony, dating back to the 1920s Congress has repeatedly rejected efforts by the record companies to obtain legislation conferring upon them a right to royalties when their sound recordings are performed by over-the-air broadcast radio and similar media. He concludes that Congress must have viewed the record companies as being adequately compensated by their receipt of a share of the proceeds of increased record sales resulting from such performances. In other words, Congress may be said to have concluded that the promotional value of radio airplay to the

increase sales of albums, the value thereby generated for owners of sound recordings plainly *exceeds* the value thereby generated for owners of musical works. The implication of this fact is that if the fundamental value of the sound recordings and the musical works is indistinguishable, competitive market royalties for sound recordings should be significantly lower than competitive market royalties for musical works.

57. The relevance of promotional value to the royalty determination is explicitly recognized by the statute, which states that the Panel should consider “whether use of the service may substitute for or may promote the sales of phonorecords.”³⁸

58. This criterion recognizes that, as a matter of logic, the digital performances at issue here could either increase or decrease record sales. This would depend on the extent to which users substitute these performances for performances that they can create for themselves by purchasing albums, or conversely the extent to which hearing sound recordings performed via streaming (within the statutory scheme of the Digital Millennium Copyright Act of 1998) generates interest in purchasing the albums in order to hear them more.

59. The Testimony of Michael Fine addresses this issue based upon the long-term experience with over-the-air radio, and the testimony of

record companies was of sufficient magnitude such that no additional compensation in the form of a royalty was either necessary or appropriate.

³⁸ 17 U.S.C. § 114(f)(2)(B)(i).

Professor Michael Mazis examines this issue in some detail, based in part on a survey of internet listeners. Professor Mazis finds that listening to music over the internet enhances rather than displaces music sales. For listeners of both rebroadcast over-the-air stations and internet-only stations, significantly more people report that listening to music over the internet caused them to increase their album purchases compared to those who reported that such listening caused them to decrease such purchases. Thus, qualitative consideration of the substitution versus promotion criterion points in the direction of a lower fee, all else equal.

60. *Relative contributions of technology, capital investment, cost, and risk.* The contributions of the owners of the sound recording rights are embodied in the recording itself. They do not contribute directly to the digital public performance. In contrast, the contributions made by the service providers in terms of technology, capital, other costs and risks are significant.

61. Streamers are making a significant investment in this young and rapidly growing industry. The cost of bandwidth is significant, to the point that many of the licensees in this proceeding incur costs to broadcast the licensed performances that exceed the revenue they receive in return. In contrast, the owners of the sound recording rights have, in many cases, already recovered their costs through the sale of albums. Overall, the licensees are clearly incurring costs relative to the revenues that they are collecting that are far greater than the costs borne by the record companies,

relative to their revenues. It is apparent from the streamer witness statements that setting fees at too high a level would seriously undermine their financial viability.³⁹

62. The risk faced by the licensees also is obvious. Streamers and streaming-related services that have failed over the past several years include: VocaLoca, Inc., iCast, BroadcastAmerica.com, Eclectic Radio, OnAir, Westwind Media.com, Soundbreak.com, Katz Interactive (media representation firm, agent for interactive audio ads on the internet; part of Katz Media Group), and Intel Internet Media Services (streaming media content business launched by Intel Corp).⁴⁰ In contrast, while the record companies face risks in the creation and promotion of any single record, they are able to spread these risks over their portfolio of recordings. They do not typically face the risk of overall business failure.

63. Many streamers are investing heavily in technological innovation, and a significant number have patents either pending or

³⁹ See, e.g., Testimony of Eric Snell, Incanta; Testimony of NetRadio; Testimony of Nathan Pearson, Jr., RadioWave; Testimony of David Juris, XACT.

⁴⁰ See Letter from Jaggi Ayyangar, CEO of VocaLoca, Inc., to Creditors of VocaLoca, Inc., dated January 17, 2001; Peter Barlas, *Audio & Video DG Systems Uses Net To Do Something Unusual – Make Profit*, Investor's Business Daily, Apr. 13, 2001; Michael Roberts, *Net Losses: Web radio's future is unlimited, but its present isn't pretty*, found at <http://www.westword.com/issues/2001-01-18/message.html> (Jan. 18, 2001); Testimony of Clifton Gardiner, Westwind Media.com; Hane C. Lee, *Soundbreak Breaks Down*, found at <http://www.thestandard.com/article/display/0.1151.22274.00.html> (Feb. 15, 2001); *Not delivering positive results, Katz Interactive shuts down*, found at <http://www.kurthanson.com/HT-RAIN/NewsArchives/0201/020101.htm>.

approved.⁴¹ These patents involve innovations in such areas as targeted advertisement insertion, listener marketing data collection and accelerated content delivery. Streamers have also invested in creating proprietary hardware and software tools.⁴² These innovations have come at considerable cost.

64. Finally, the nature of the legal right being conveyed here is significantly restricted relative to the right conveyed by a musical work performance license. As discussed further in Professor Fisher's testimony, the rights conveyed under Section 114 bear certain specific limitations that *do not* apply to the musical work performance rights whose value has been calculated above. From an economic perspective, a legal right that is restricted in various ways is likely to be less valuable, all else equal, than one that is not.

65. The combination of all of these factors provides overwhelming qualitative evidence that the reasonable rates for the purpose of this proceeding are significantly lower than those implied by direct translation of the fees from the benchmark setting. It is difficult, however, to quantify the precise magnitude of the downward adjustment that should be made. The next two subsections explore the quantitative evidence that I

⁴¹ See, e.g., Testimony of Echo Networks Inc.; Testimony of Michael Peterson, CLBN; Testimony of myplay; Testimony of RadioWave; Testimony of Incanta; and Testimony of Everstream.

⁴² See, e.g., Testimony of NetRadio; Testimony of RadioWave; Testimony of Westwind Media.com; Testimony of CLBN; and Testimony of Everstream.

have been able to identify that sheds some light on the appropriate magnitude of the discount.

B. International evidence on the appropriate discount

66. Unlike the U.S., many countries in the world recognize a fee obligation for over-the-air radio in connection with public performance of sound recordings. As explained further in the testimony of Paul Kempton,⁴³ in almost all cases where countries have analogous fees for public performance of both musical works and sound recordings, the fee for the sound recordings is no higher, and is generally lower. The international experience described by Mr. Kempton is summarized visually in Exhibit 1.⁴⁴ The Exhibit shows, for the 12 countries for which Mr. Kempton was able to make a meaningful comparison, the ratio of: (1) the royalty associated with the performance of the sound recording to (2) the royalty associated with the performance of the musical work.

67. The lowest value of this ratio is .11, while the highest value of this ratio is 1.06. The median across all countries is about .66. Australia, Italy, Switzerland, the Netherlands, Spain, Austria, the U.K., Germany, and Sweden all have sound recording royalties less than the musical work

⁴³ See Testimony of Paul Kempton.

⁴⁴ As explained further by Mr. Kempton, in some countries the royalties vary with certain attributes of the licensees in ways that differ for the two rights. These situations lead to a range of possible ratios within those countries. Consistent with the testimony of Mr. Kempton, for countries where the royalties vary according to revenue, a range based on the highest and lowest revenue thresholds is indicated in the Exhibit by the shaded areas. In instances where royalties vary according to music use, the royalty associated with the highest percentage of music use was used to calculate the ratio.

royalties. France is the only country in which the royalty for the performance of sound recordings is higher than the royalty for the performance of musical works. This is the result of having to reduce that country's stated royalty for musical works to adjust for the fact that that royalty covers both performance rights and mechanical reproduction rights. Since the sound recording royalty in France does not include the mechanical reproduction right, I have used the adjusted musical works royalty as described in the testimony of Mr. Kempton in order to make an "apples to apples" comparison of the two rates.

68. It is unclear to what extent the differing ratios across countries are driven by differences in promotional value, differences in the nature of the rights in each case, or combinations of both. Overall, however, the tendency toward a significant discount for sound recordings in most countries is clear. Further, the discounts shown in Exhibit 1 *do not* reflect any adjustment for the market power-elevated fee level inherent in the ASCAP/BMI/SESAC benchmark, because the Exhibit compares fees that are typically created in similar ways. There is also no reason to believe that these fees reflect the statutory considerations of the investments, costs, and risks born by the streamers in establishing this new medium.

C. **Quantification of the over-the-air promotional value as a basis for estimating the discount**

69. As discussed above, it is difficult to know what combination of market, legal, and institutional factors drives the variations across countries shown in Exhibit 1. An alternative approach is to estimate the

difference in the royalties for musical works and sound recordings based on a quantification of the magnitude of promotional value. An advantage of this approach is that it is tied to economic information from the U.S. The disadvantage is that it can only be estimated roughly from publicly available data. Further, this estimate reflects only the magnitude of the discount that would be appropriate *solely* to address the likely difference in promotional value. As such, it understates the magnitude of the discount necessary to produce a reasonable fee, since the promotional value difference is only one of the multiple factors suggesting a significant fee reduction.

70. The basis of the calculation is the difference, as mentioned above, between the benefit derived by sound recording owners and the benefit derived by musical work owners from the sale of albums promoted by over-the-air radio. Approximately 785 million albums were sold in the U.S. in 2000.⁴⁵ As discussed in detail in the testimony of Mr. Fine, surveys conducted by Soundscan indicate that at least 27% of album sales can be attributed directly to radio play,⁴⁶ in the sense that purchasers indicated that radio was the primary factor leading them to make a given album purchase. This suggests that at least 212 million albums were sold due directly to radio play.

71. These album sales generate value for the owners of both

⁴⁵ See Testimony of Michael Fine. An album is considered to be any *full-length* CD, cassette, vinyl record, or audio DVD.

⁴⁶ See Testimony of Michael Fine.

the musical work and the sound recording rights. In the case of composers, the economic value derived from album sales is a "mechanical" royalty. The value of this royalty has been estimated at \$.73 per album.⁴⁷ In addition, composers receive mechanical royalties on the sale of singles. I estimate that 31 million singles are sold per year, generating mechanical royalties of \$.07 each.⁴⁸ I do not have information on the fraction of singles sales induced by radio, so I will simply make the overly conservative assumption that *all* singles sales are induced by radio. Adding together promotional value from albums and singles yields a total of \$157 million in promotional value per year. This annual benefit derived by composers and their publishers from radio-induced album and singles sales constitutes the value to them of the promotion created by the public performance of their musical works on radio. It is shown on the first line of Exhibit 2.

72. The *total consideration* received by composers as a group for radio performances is the sum of this promotional value and the royalties paid. The total royalties paid to the three musical work licensing

⁴⁷ See M. Nathanson, *The Music Industry and The Internet*, Industry Report (Sanford C. Bernstein & Co., Inc., Dec. 8, 2000) at 2. The ceiling on this mechanical royalty is set by statute at \$0.0755 per song. It is common, however, for the record labels to negotiate an agreement with their artists, who are often also the composers of the songs on an album, to reduce the mechanical royalty and/or limit it to a maximum of 10 songs per album. See *You Never Give Me (My) Money: Or 'How Come I Didn't Get Any Mechanicals?'*, in Anthony R. Berman, Esq., *Multimedia & Entertainment Law Online News*; Volume II, No. 208, 1996; http://www.ibslaw.com/melon/archive/208_money.html. The estimate of \$.73 per album thus may overstate somewhat the mechanical royalty because of the prevalence of such royalty-limiting agreements (in which event my calculations merely *understate* the difference between the promotional value derived by composers and labels from the sale of sound recordings).

⁴⁸ See Berman, *supra* note 47, at 2.

organizations is not publicly available. Exhibit 2 contains an estimate for this total of about \$343 million per year.⁴⁹ Adding together the promotional value and the estimate of royalties, I arrive at line 3 in Exhibit 2, the total consideration received by composers for radio performances of about \$500 million.

73. The owners of the rights to the sound recordings benefit from album sales due to recording company profits. The operating profit per CD earned by recording companies has been estimated to be about \$1.65.⁵⁰ The accounting concept of operating profit is likely to understate the economic benefit to the record labels, because incremental album sales generated by revenue also contribute margin that helps to cover overhead costs. But to be conservative, I limit the calculation to the use of operating profit. Based on RIAA data, I assume that of the 212 million radio-induced album sales, approximately 195 million are CDs. Assuming *no profit* for non-CD album sales, this translates into promotional value for the owners of the sound recordings of about \$322 million per year.⁵¹ Of course, by statute, the owners of sound recordings do not receive any royalties from the radio broadcast performances. But if it is true that the overall value of the sound

⁴⁹ Estimate based on ASCAP press release, May 18, 1998, <http://www.ascap.com/press/radio-051898.html>; and on ASCAP/BMI/SESAC fee data for sample of radio stations. It should also be kept in mind that for an estimate of the total *reasonable* license fees, this figure is too high for the reasons discussed elsewhere within this report.

⁵⁰ See Berman, *supra* note 47 at 2.

⁵¹ Record labels do not earn profits directly from singles, so I have not included any amount for promotional value to the record labels associated with the sale of singles. See *supra* note 47 at 2.

recordings and the musical works is comparable, then the overall value of the performances of the sound recordings would be the same \$500 million estimated for the composers. This yields an implied sound recording royalty of about \$178 million per year.

74. This implied sound recording royalty is about 52% of the estimated musical works royalty. This estimate suggests that, even without consideration of the likely elevation of the benchmark fees due to ASCAP/BMI/SESAC market power or the specific statutory criteria related to the streamers' contributions and risks, a substantial discount off of the benchmark fee would be appropriate due solely to the promotional value consideration alone.

V. SUMMARY OF THE PROPOSED REASONABLE FEE MODEL

75. As discussed in the previous section, there are multiple important factors suggesting that the reasonable fee for this proceeding is significantly less than the benchmark fee level. Because some of these factors are qualitative, and others are difficult to quantify with precision, it is difficult to put a precise numerical value on the magnitude of the appropriate discount. The international data confirm that sound recording performance fees are typically less than musical work performance fees, but accommodate a very wide range of ratios between the two. The promotional value calculation suggests that a discount of almost 50% would be appropriate based on that consideration *alone*. Neither of these analyses reflects any adjustment for the market power of ASCAP/BMI/SESAC, or application of

the statutory considerations related to the investments, costs, and risks of the streamers. Given this evidence, setting the sound recording performance royalty in the range of 40% to 70% of the benchmark musical works royalty is likely to approximate the reasonable rate that is consistent with the statutory criteria. The lower end of this range would allow for an additional discount beyond that implied by the promotional value calculation, to allow for the additional factors that that calculation ignores. The upper end of the range would allow for the uncertainty that is inherent in the estimates of the elements of that calculation. And the entire range lies within the range of experience observed internationally.

76. Using the conservative adjustment corresponding to the upper limit of this range (sound recording royalty at 70% of musical works royalty), I propose a reasonable fee structure under Section 114(f)(2)(B) as follows. Any licensee can choose a blanket license, and pay a fee calculated at a rate no more than \$.0015 times ATH (\$.0022 per listener hour from the ASCAP/BMI/SESAC blanket data times .70).⁵² In a given license period, streamers that broadcast on average fewer than seven songs per hour for which sound recording rights must be secured from RIAA can, if they choose, elect instead the listener-song model. For this model, the fee would be \$.00014 (\$.00020 times .70) times the streamer-specific average number of

⁵² Streamers who have not tracked ATH could substitute average listeners based on ratings data times the number of broadcast hours.

songs per hour, times the average listenership.⁵³ Streamers that, in a given license period, have less than 60% of broadcast time containing sound recordings for which sound recording rights must be secured from RIAA can, if they choose, elect the segmented-listener-hour model.⁵⁴ For this model, the fee would be the appropriate listener-hour fee, times the fraction of the streamer's broadcast time containing sound recordings for which the rights must be secured.

77. *Minimum fee.* The statute specifies that a minimum fee be imposed to ensure that copyright owners are fairly compensated in the event that other methodologies for setting rates might deny copyright owners an adequate royalty.⁵⁵ A minimum fee of \$250 per licensee per year, regardless of the number of listeners, would be consistent with minimum fees that are

⁵³ The seven-song maximum for this option is approximately the minimum number of average songs for programming formats represented in our blanket license data. Average listeners could come from external ratings, or could be calculated as ATH divided by hours broadcast.

⁵⁴ The 60% maximum is approximately the minimum of our blanket license database, derived by comparing the minimum number of average songs (7) to the maximum number of average songs (13).

⁵⁵ The legislative history gives several examples of the kinds of situations where a minimum fee might be necessary: "For example, a copyright arbitration royalty panel should set a minimum fee that guarantees that a reasonable royalty rate is not diminished by different types of marketing practices or contractual relationships. For example, if the base royalty for a service were a percentage of revenues, the minimum fee might be a flat rate per year (or a flat rate per subscriber per year for a new subscription service)." H. Conf. Rep. No. 105-796, 105th Cong., 2d Sess., at 85-86 (1998). These examples might be taken to suggest that the use of the listener-hour model—which is not affected by marketing practices or contractual relationships—obviates the need for a minimum fee. Indeed, the suggestion that a flat rate per subscriber could be the minimum fee suggests that the result of the listener-hour model could itself constitute the minimum fee.

typical in royalty agreements.⁵⁶

78. *Exclusion of listeners within 150 miles.* Many listeners to broadcaster streamers use the internet merely as an alternative means of accessing their local over-the-air stations.⁵⁷ In such a case, the listener has access to a means of hearing the same broadcast that does not generate *any* royalty obligation for the performance of the sound recording. From an economic perspective, it makes little sense for these two similar means of hearing the same performance to encompass different royalty obligations. Further, Congress specifically exempted from the sound recording performance royalty obligation digital rebroadcasts of over-the-air broadcasts that are only heard within 150 miles of the radio broadcast transmitter.⁵⁸ The combination of the existence of the “free” over-the-air performance and the Congressional exclusion suggests that it would be appropriate, within the context of the listener-based models presented here, to allow broadcaster streamers to exclude from the fee calculations those listener hours that are

⁵⁶ For example, a minimum fee of \$264 per year applies in the ASCAP Experimental License Agreement for Internet Sites on the World Wide Web—Release 3.0.

⁵⁷ The NPD survey of internet listening habits, as summarized in the Testimony of Professor Mazis, found that the majority of respondents indicated that the station that they listened to most recently over the internet could be heard at home, at work, or in the car (53%), and that this station is within 150 miles of the computer that they listen to (51%). A recent survey by Arbitron found 56% of internet listeners listen to local stations. See The Arbitron Company/Edison Media Research, *Internet VI: Streaming at a Crossroad* (Jan. 2001) at 13.

⁵⁸ Section 114(d)(1)(B)(i). I understand that there is a legal dispute regarding the question of whether the simultaneous internet transmission (without regard to geographic limit) of over-the-air broadcast programming is exempt from the sound recording performance right under Section 114(d)(1)(A). *Bonneville v. Peters*, No. 01-408 (E.D. Pa., filed January 25, 2001).

associated with listeners within the 150-mile limit.

79. *Retroactive fees.* It is likely that many streamers will be paying the minimum fee in the first CARP period (1998-2000) because they had small audiences. If a streamer had annual ATH of fewer than 163,000 per year (average listening audience of about 19 for a licensee broadcasting 24 hours a day, 7 days a week), then that streamer would pay the minimum fee. My evaluation of the data on ATH from several streamers suggests that even extrapolating ATH from the beginning of 2001, many streamers will pay at or near the minimum fee.⁵⁹

VI. EPHEMERAL COPIES

80. It is my understanding that, in addition to the royalty for the right of public performance discussed above, the Panel will be considering the royalty for the creation of certain copies of sound recordings made in connection with digital transmission, known as "ephemeral copies." These copies are made solely for the purpose of effectuating the digital transmission of performances. The obligation to secure the right to make these copies falls on the streamers discussed above who are licensed under Section 114(d)(2), as well as on other parties that transmit music to business establishments and are exempt from the payment of royalties for the performance of sound recordings pursuant to Section 114(d)(1)(C)(iv).

81. Professor Zittrain in his testimony provides a detailed

explanation of how these copies come to be made and the function that they perform in effectuating transmission. Based on the testimony of Professor Zittrain, it is my understanding that these copies do not achieve any purpose or create any economic value other than facilitating and effectuating the public performances. Decisions regarding how and when such copies come to be made either are determined by requirements of the technologies used or are driven by the desire on the part of the streamer to reach the largest possible audience. Of course, to the extent that the making of ephemeral copies permits the reaching of a larger audience, this benefit will result in greater total value of the performances themselves.

82. Under these circumstances, there cannot be any economic value associated with the right to make these copies that is separate or distinct from the value of the performances they effectuate.⁶⁰ From an economic perspective, it is immaterial how many distinct legal rights are necessary to effectuate the performances. It is the performances that generate the economic value. If that value is distributed over multiple distinct rights (all of which serve to create value only in proportion to the number of performances), the *total* value has to remain the economic value of the performances themselves.

⁵⁹ This is consistent with the fact that many streamers still have tiny audiences compared with the standards of broadcast radio. *Internet VI*, *supra* note 57 at 11.

⁶⁰ Professor Fisher suggests another plausible economic function of the § 112(e) royalty – namely, to compensate copyright owners for any “leakage” resulting from ephemeral copies in the form of unauthorized reproductions made therefrom. Fisher Testimony. Since I am

83. The reasonable performance fee calculations described in the earlier sections of this report are derived from the over-the-air radio context, in which broadcasters do not have to pay any additional royalty for the right to make ephemeral copies. This means that the reasonable fees calculated therefrom correspond to the total economic value of the performances. If there is to be a separate and distinct royalty for the right to make ephemeral copies, the *sum* of the royalty for that right and the royalty for the right of public performance should be set equal to the reasonable fee total described above.

84. It is my understanding that any payments for the right to make ephemeral copies would typically be made to the same parties to whom payments would be made for the right of public performance. Given this situation, and the inherent interconnection of the economic value of the two rates, the most straightforward formulation is to specify a single royalty for the package of the two rights. A reasonable level for this "package" royalty would be that determined by the fee formula described above.

85. If it is deemed necessary to identify what portion of the overall reasonable fee corresponds to the ephemeral copyright, its fundamentally subsidiary nature suggests that it would be a very small fraction. By analogy, suppose that I had determined that the "reasonable" rental rate for a certain car is \$29.95 per day. Now suppose that it were

unaware of any evidence that such leakage is occurring or likely to occur, I have not

required, for some reason, to identify two distinct rental rates, one for the car keys and one for the car itself. Clearly, the sum of these two rental rates has to be \$29.95 per day. So long as the two rates add up to this amount, for most purposes it wouldn't matter how that overall amount were divided between the keys and the car, because all customers would rent both, and they would rent both from the same party. Still, if some breakdown were required, it would make sense to assign only a trivial value to the keys. As essential as they are for the customer to be able to utilize the car, they constitute only a minor aspect in the overall creation of value for the customer, which is represented by the use of the car itself.

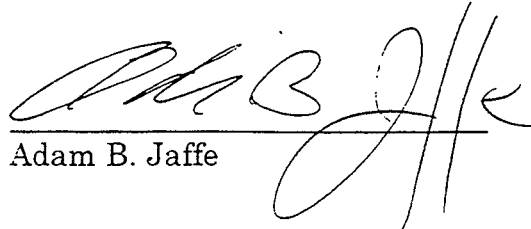
86. It is my understanding that the background music services are exempt from the obligation to make payments for the right of public performance of sound recordings. The statutory and policy contexts of this exemption are discussed by Professor Fisher, who explains why any fee above a nominal level for the ephemeral copies made by these services would eviscerate the Congressional intent in granting the exemption from the performance royalty. As explained above, if one must make a division of the overall value of the performances into a portion associated with the performance right and a portion associated with copies that only facilitate performances, the clearly subsidiary nature of the ephemeral right suggests that it would represent only a very small share of the overall value. This

attributed any value to this factor in my present analysis of the § 112(e) license.

implies that an appropriate treatment for entities exempt from the performance right is that they pay a fee for ephemeral copies that is a very small fraction of the overall value of the performances. Such a small percentage would also be consistent with Professor Fisher's testimony regarding the need to avoid undoing Congress's action in granting the performance right exemption.⁶¹

⁶¹ See Fisher Testimony.

I hereby declare under penalty of perjury under the laws of the United States that the foregoing testimony is true and correct to the best of my knowledge, information and belief.


Adam B. Jaffe

Executed this 6th day of April, 2001:

APPENDIX A

ADAM B. JAFFE

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PROFESSIONAL EXPERIENCE

Brandeis University, Faculty of Arts and Sciences and Graduate School of International Economics and Finance, Waltham, MA

Chair, Department of Economics, 2000 - present

Chair, Brandeis Intellectual Property Policy Committee, 2000 - present

Professor of Economics, 1998-present

Associate Professor of Economics, 1994 - 1998

Teaching industrial organization, environmental economics, and regulatory economics. Current research examines the use of patent citation data to trace knowledge flows; technology transfer from public research to the private sector; and the role of energy prices and public policy in energy-related technological change.

Harvard University, Faculty of Arts and Sciences, Cambridge, MA

Associate Professor of Economics, 1989 - 1994

Assistant Professor of Economics, 1985 - 1989

Taught graduate and undergraduate courses in Applied Microeconomics, Industrial Organization, Economics of Innovation, and Government Regulation and Antitrust Policy. (On leave, Academic Year 1990-91; visiting the Kennedy School of Government, 1992-94)

President's Council of Economic Advisers, Washington, DC

Senior Staff Economist, 1990 - 1991

Primary staff responsibility for antitrust issues, science and technology policy, energy policy, and regulatory issues related to telecommunications.

EDUCATION

Harvard University, Cambridge, MA

Ph.D. in Economics, 1985

Dissertation: "Quantifying the Effects of Technological Opportunity and Research Spillovers in Industrial Innovation"

Massachusetts Institute of Technology, Cambridge, MA

S.M. in Technology and Policy, 1978

Thesis: "Regulating Chemicals: Product and Process Technology as a Determinant of the Compliance Response"

S.B. in Chemistry, 1976

TESTIMONY AND CONSULTING EXPERIENCE

The Burlington Northern and Santa Fe Railway Company (Steptoe & Johnson, Washington, DC)
Before the American Arbitration Association, Tucson Electric Power Company, Claimant, v. Burlington Northern and Santa Fe Railway Company, Respondent. Direct testimony in an arbitration proceeding concerning a coal transportation contract, January 26, 2001; deposition, February 9, 2001.

Cheminova A/S (Beveridge & Diamond, Washington, DC)
Before the American Arbitration Association, In The Matter of Arbitration Between Cheminova A/S, Claimant and Griffin LLC, Respondent, Docket No. 23 171 00020 99. Direct oral testimony in a data compensation case concerning a pesticide, December 7, 2000; rebuttal oral testimony, December 9, 2000.

Music Choice (Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, Washington, DC)
In the United States District Court, Southern District of New York, United States of America against Broadcast Music, Inc., et ano., In the Matter of the Application of Music Choice, et al., Applicants, for the Determination of Reasonable License Fees. Affidavit, July 28, 2000; Expert Report, January 26, 2001; Supplemental Expert Report, March 9, 2001; Deposition, March 28, 2001; Affidavit, April 9, 2001.

Wilson-Cook Medical Incorporated (Brinks Hofer Gilson & Lione, Chicago, IL)
In the United States District Court for the District of Massachusetts, Boston Scientific Corporation and SCIMED Life Systems, Inc., v. Wilson-Cook Medical Incorporated. Expert Report analyzing irreparable harm related to preliminary injunction in a patent infringement case, July 26, 2000; Deposition, July 27, 2000; Supplemental Expert Report, September 15, 2000.

Owens-Corning (Forman, Perry, Watkins, Krutz & Tardy, Jackson, MS)
In the Circuit Court of Jefferson County, Mississippi, Ezell Thomas, et al. (as to all defendants) and Owens-Corning (as to tobacco defendants only) versus R.J. Reynolds Tobacco Company, et al., and Amchem Products, Inc., et al. Expert Report prepared on behalf of Owens Corning in tobacco litigation, June 14, 2000; Deposition, September 13, 2000.

Castano Tobacco Litigation Plaintiffs Legal Committee (Murray Law Firm, New Orleans, LA)
In the Civil District Court for the Parish of Orleans, State of Louisiana, Gloria Scott and Deania M. Jackson, et al., vs. The American Tobacco Company, Inc., et al. Expert Report prepared on behalf of the Castano Tobacco Litigation Plaintiffs Legal Committee, June 6, 2000; Deposition, October 18, 2000.

Ellis Simon, et al. (Brown, Rudnick, Freed & Gesmer, Boston, MA)
In the United States District Court, Eastern District of New York, Ellis Simon, et al., v. Philip Morris Incorporated, et al., CV-99-1988, First Amended Class Action Complaint. Testimony on behalf of the plaintiffs in tobacco litigation; Expert Disclosure Statement, December 20, 1999; Deposition, February 28, 2000; Affidavit, April 13, 2000.

Vastar Resources, Inc.

Before the United States of America, Department of the Interior, Minerals Management Service, Further Supplementary Proposed Rule for Establishing Oil Value for Royalty Due on Federal Leases, Affidavit, January 31, 2000. Before the United States of America, Department of the Interior, Minerals Management Service, Vastar Resources, Inc.'s Request for a Binding Value Determination on Transportation Allowances, Affidavit April 4, 2000. Testimony on behalf of Vastar Resources, Inc., on issues related to the appropriateness and reasonableness of various methodologies that may be employed for the purpose of determining transportation allowances to be used for royalty payments from federal leases.

Pharmaceutical Research and Manufacturers of America

Prepared research report entitled "Consequences of Pharmaceutical Price Controls on Innovation" (with Catherine Moore), May 1999.

PacifiCorp

Before the Public Utility Commission of Oregon, UE 102, In the Matter of the Application of Portland General Electric Company for Approval of the Customer Choice Plan. Testimony on behalf of PacifiCorp regarding the company's eligibility to participate in an auction of generation assets, April 26, 1999.

Turner Broadcasting System, Inc., et al. (Weil, Gotshal & Manges, New York)

In the United States District Court, Southern District of New York, United States of America against American Society of Composers, Authors, and Publishers, In the Matter of the Application of Turner Broadcasting System, Inc., et al., Applicants, For the Determination of Reasonable License Fees, CIV. NO. 13-95 (WCC), Expert Report prepared on behalf of the applicants in litigation about music licensing fees, April 16, 1999; Deposition, July 26-27, 1999; Rebuttal Expert Report, December 16, 1999; Deposition, March 3, 2000.

The American Chemical Society

Developed and evaluated a number of approaches to pricing the web editions of ACS's publications. Modeled the performance of the various pricing plans to assess their ability to protect ACS's publications revenue as web editions replace paper. (1999)

Copyright Clearance Center, Inc. (Weil, Gotshal & Manges, New York, NY)

Primary consultant on statistical and economic matters since 1985; designed and implemented CCC's initial statistical methodology for pricing corporate photocopy licenses; recently assisted the Rightsholders Committee of the Board of Directors in designing a new market-based approach to valuation of copyright licenses and distribution of the resulting royalties. (ongoing)

Procter & Gamble, Inc.

In the Matter Between Unilever PLC. and Lever Brothers Limited, Plaintiffs, and Procter & Gamble, Inc., and the Procter & Gamble Company, Defendants, Court File No. T-2534-85, Expert Report prepared on behalf of the defendants in patent dispute, January 11, 1999; Reply Report, January 29, 1999; Oral testimony, December 6-7, 1999.

Ironworkers Local Union No. 17 Insurance Fund and its Trustees (Milberg, Weiss, Bershad, Hynes & Lerach, San Diego)

Ironworkers Local Union No. 17 Insurance Fund and its Trustees, et al., vs. Philip Morris, Inc., et al. (Ohio), Expert Report prepared on behalf of the plaintiffs in tobacco litigation, November 6, 1998; Supplemental Report, December 17, 1998; Deposition, January 11 and 21, 1999; Oral testimony, February 23, 1999.

State of Wisconsin (Habush, Habush, Davis & Rottier, Milwaukee, WI)

The State of Wisconsin v. Philip Morris, et al. Prepared Expert Witness Report on behalf of the plaintiffs in tobacco litigation, November 1, 1998.

Trans-Alaska Pipeline (Steptoe & Johnson, Washington, DC)

In the Matter of the Correct Calculation and Use of Acceptable Input Data to Calculate the 1997, 1998, 1999, 2000 and 2001 Tariff Rates for the Intrastate Transportation of Petroleum over the Trans Alaska Pipeline System Filed by Amerada Hess Pipeline Corporation; Arco Transportation Alaska, Inc.; BP Pipelines (Alaska) Inc.; Exxon Pipeline Company; Mobil Alaska Pipeline Company; Phillips Alaska Pipeline Corporation; Unocal Pipeline Company; Phillips Transportation Alaska, Inc.; and Williams Alaska Pipeline Company, LLC, and the Protest by Tesoro Alaska Petroleum Company of the 1997 and 1999 Tariff Rates, Before the Regulatory Commission of Alaska, Docket No. P-97-4. Prepared direct testimony evaluating whether the TAPS Intrastate Settlement and the ratemaking methodology it established produce tariff rates that are just and reasonable, October 8, 1998; second prepared direct testimony, July 12, 2000; prepared rebuttal testimony, February 26, 2001.

Commonwealth of Massachusetts (Brown, Rudnick, Freed & Gesmer, Boston, MA)

The Commonwealth of Massachusetts vs. Philip Morris Incorporated, et al., Civil Action Number 95-7378. Prepared Expert Disclosure Report on behalf of the plaintiffs in tobacco litigation, June 16, 1998. Affidavit in Opposition to Defendants' Motions for Summary Judgement, October 30, 1998.

CBS (Weil, Gotshal & Manges, New York)

CBS Inc. v. American Society of Composers, Authors & Publishers, New York State Supreme Court, New York County. Prepared Expert Report regarding timing of payments under ASCAP agreements, August 11, 1997. Deposition taken June 12, 1998. Addendum to Prepared Expert Report, December 1, 1998. Supplemental deposition, January 28, 1999.

Public Broadcasting System, National Public Radio, and the Corporation for Public Broadcasting (Weil, Gotshal & Manges, New York)

Prepared testimony regarding royalties for copyrighted musical compositions, *In the Matter of the Rates for Noncommercial Educational Broadcasting Compulsory License, Before the Copyright Arbitration Royalty Panels, Docket No. 96-6, CARP NCBRA, 1997.* Written testimony, April 1, 1998. Oral testimony, April 1-2, 1998. Rebuttal testimony, April 15, 1998. Oral rebuttal testimony, May 7, 1998.

State of Minnesota (Robins, Kaplan, Miller & Ciresi, Minneapolis, MN)

The State of Minnesota and Blue Cross and Blue Shield of Minnesota vs. Philip Morris Incorporated, et al., Court File No. C1-94-8565. Prepared Expert Witness Report on behalf of

the plaintiffs in antitrust litigation involving allegations of collusive conspiracy, May 29, 1997. Deposition, taken June 26-27, 1997. Oral trial testimony, March 18-23, 1998.

PacifiCorp (Stoel Rives, Portland, OR)

PacifiCorp, Electric Restructuring Transition Plan, Before the Montana Public Service Commission, Docket No. D97.7.91. Prepared prefiled rebuttal testimony evaluating testimony regarding market power in the generation of electricity in Montana, February 24, 1998. Prefiled surrebuttal testimony, July 21, 1998.

PacifiCorp (Stoel Rives, Salt Lake City, UT)

Snake River Valley Electric Association v. PacifiCorp, United States District Court for the District of Idaho, Case No. CV 96-0308-E-BLW. Prepared Expert Witness Statement analyzing allegations of anticompetitive behavior (1997). Prepared Affidavit evaluating market power (1998).

Trans-Alaska Pipeline (Steptoe & Johnson, Washington, DC)

Prepared Affidavit and Rebuttal Affidavit evaluating the competitive impact of the Amended and Restated Capacity Settlement Agreement, *Exxon Pipeline Co., et al., Application of TAPS Carriers for Approval of Amended and Restated Capacity Settlement Agreement, Before the Federal Energy Regulatory Commission, Docket No. OR96-1-000, et al.* (1997)

The Burlington Northern and Santa Fe Railway Company (Steptoe & Johnson, Washington, DC)

Prepared Verified Statement regarding market power in transporting coal, *In the Matter of Western Fuels Service Corporation v. The Burlington Northern and Santa Fe Railway Company, Before the Surface Transportation Board, STB Docket No. 41987.* (1997)

PacifiCorp (Stoel Rives, Portland, OR)

Assisted in FTC pre-merger Hart-Scott-Rodino review; prepared *Economic Analysis of Alleged Vertical Market Power Consequences of Merger of PacifiCorp and Peabody Coal.* (1997)

Subaru of New England, Inc. (Todd & Weld, Boston, MA)

Subaru of New England, Inc., vs. Subaru of Wakefield, Inc., Civil Action No. 96-01475-A, Commonwealth of Massachusetts, Norfolk County, Superior Court Department. Prepared Affidavit regarding appropriate methodology for assessing competitive impact of dealer relocation, November 20, 1996.

Public Service Company of New Hampshire

Direct testimony before the State of New Hampshire Public Utilities Commission, Docket No. DR 96-150, Electric Industry Restructuring, with Joseph P. Kalt, October 18, 1996.

Pro Se Testimony

United States of America before the Federal Energy Regulatory Commission "Alternatives to Traditional Cost-of-Service Ratemaking for Natural Gas Pipelines, Regulation of Negotiated Transportation Services of Natural Gas Pipelines," Docket No. RM-96-7-000. Comments of Adam B. Jaffe and Joseph P. Kalt, May 30, 1996.

Massachusetts Technology Collaborative

Prepared a study assessing the effects of reductions in federally-funded R&D on the Massachusetts economy. (1995-96)

Federal Trade Commission

Asked by Commission staff to prepare testimony for Hart-Scott-Rodino preliminary injunction hearing regarding anticompetitive impact of a proposed acquisition. (1995)

GAF Corporation, et al. (Hannoch Weisman, Roseland, NJ)

Joseph Rossi, et al., vs. Standard Roofing, et al., Civil Action No. 92-5377, United States District Court, District of New Jersey. Prepared Expert Witness Report on behalf of six defendants in antitrust litigation involving conspiracy and monopolization claims. (1995)

Connecticut Light and Power Company

Before the Connecticut Department of Public Utility Control, Investigation into Restructuring of the Electric Industry, Docket No. 94-12-13. Submitted written and oral hearing testimony. (1995)

New England X-Ray & Electronics Inc. (Kushner & Sanders, Wellesley, MA)

New England X-Ray & Electronics Inc. vs. Robert T. Kennedy, Inc., et al., Commonwealth of Massachusetts, Number 88-5532. Presented damages study and jury trial testimony regarding breach of contract. (1990-95)

Florida Gas Transmission Company

Written testimony before the Federal Energy Regulatory Commission, Docket No. RP95-103-000, supporting FGT's proposed flexible service offerings, inflation-indexed rate, and removal of regulatory constraints on the secondary market for pipeline capacity. (1995)

Burlington Northern Railroad Company (Steptoe & Johnson, Washington, DC)

Southwestern Electric Power Company, Plaintiff, vs. Burlington Northern Railroad Company, Defendant, in the 102nd Judicial District Court of Bowie County, Texas, No. D-102-CV-91-720. Presented oral trial testimony before a state court jury regarding the pricing provisions in two long-term coal transportation agreements, in defense against a claim by the shipper of overcharges resulting from the contract rates failing to reflect the railroads' productivity improvements. (1994)

Houston Lighting & Power Company

Written testimony before the Texas Public Utilities Commission, Docket No. 12065, regarding appropriate regulatory policy changes dictated by emerging competition in electricity markets. (1994)

Boston Ventures Management (Boston, MA)

Prepared a report for a venture capital firm on the adverse consequences on investment of the re-regulation of cable TV. (1994)

Kern River Gas Transmission Company (Salt Lake City, UT)

Before the Public Service Commission of Utah, Application of Mountain Fuel Supply Company for Approval of Modifications to its Tariff to Implement a Firm Transportation Rate, Docket No. 94-057-02. Prepared pre-filed direct and rebuttal testimony, as well as oral testimony, before the Public Service Commission of Utah regarding the appropriateness of a firm gas distribution tariff including within it costs of upstream pipeline transportation. (1994)

Burlington Northern Railroad Company (Steptoe & Johnson, Washington, DC)

In the Matter of the Arbitration between Public Service Company of Oklahoma and Burlington Northern Railroad Company. Delivered written and oral testimony concerning the interpretation of the pricing and renegotiation provisions of a long-term coal transportation agreement. (1994)

Arco Pipe Line Company (Steptoe & Johnson, Washington, DC)

Prepared written Comments in Response to Notice of Inquiry, Market-Based Ratemaking for Oil Pipelines, U.S. Federal Energy Regulatory Commission, Docket No. RM94-1-000. (1994)

Kern River Gas Transmission Company (Wright and Talisman, Washington, DC)

Before the Federal Energy Regulatory Commission In the Matter of Kern River Gas Transmission Company, Docket No. RP92-226-000. Delivered written and oral testimony regarding rate design for pipelines built under optional certificates. (1993)

ISK Biotech Corp. (Beveridge and Diamond, Washington, DC)

In the Matter of the Arbitration between ISK Biotech Corporation and Veterans Chemicals, prepared testimony regarding allocation rules and competitive impacts in an arbitration proceeding regarding data compensation under the Federal Insecticide, Fungicide and Rodenticide Act. (1993)

Geneva Steel Corp., et al. (Kimball, Parr, Waddoups, Brown & Gee, Salt Lake City, UT)

Before the Utah Public Service Commission Docket No. 93-057-01, written testimony regarding antitrust implications of LDC treatment of pipeline charges under FERC Order 636, on behalf of a coalition of interruptible shippers. (1993)

Enron Gas Services Corp.

Co-authored study analyzing appropriate Public Utility Commission policy towards utility procurement of natural gas and emissions allowances in developing competitive markets. (1993)

New York Power Authority

Prepared analysis and delivered public hearing testimony before the Board of Trustees regarding the economic consequences of below-market pricing for electricity. (1993)

Coalition of Non-Utility Generators

Co-authored study analyzing the effect of power from non-utility generators on electricity prices in New England. (1993)

U.S. Department of Commerce, Economics and Statistics Administration

Co-authored study analyzing the effect of U.S. environmental regulations on U.S. competitiveness. (1993)

International Energy Group

Before the Federal Energy Regulatory Commission, Docket No. PL91-1-000, prepared written testimony regarding electricity transmission access policy. (June 1991)

El Paso Natural Gas Co. (Andrews & Kurth, Washington, DC)

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"The Meaning of Patent Citations: Report on the NBER/Case-Western Reserve Survey of Patentees," NBER Working Paper No. 7631, April 2000.

OTHER PROFESSIONAL ACTIVITIES

Co-organizer, National Bureau of Economic Research Innovation Policy and the Economy Group, 1999-present

Member, National Academy of Engineering Committee on the Impact of Academic Research on Industrial Performance, 1998-present

Lead author, Third Assessment Report, Intergovernmental Panel on Climate Change, 1998-present

Associate Editor, *Rand Journal of Economics*, 1997-present

Member, Board of Editors, *Journal of Industrial Economics*, 1995-present

Member, Economics Roundtable, Advanced Technology Program, U.S. National Institute of Standards and Technology, 1995-present

Co-organizer of the National Bureau of Economic Research Science and Technology Policy Research Workshop, 1995-1998

Member, Board of Editors, *American Economic Review*, 1994-present

Project Coordinator, National Bureau of Economic Research Project on Industrial Technology and Productivity, 1994-1999

Member, Stanford Energy Modeling Forum, Working Group on Competitive Electricity Markets (EMF 15)

Member, Economic Impact Committee, Association of University Technology Managers, 1994-1995

Contributing Author, Working Group III (socioeconomics) of the Intergovernmental Panel on Climate Change (IPCC), 1993-1994

Member, Stanford Energy Modeling Forum, Working Group on Energy Conservation (EMF 13), 1992-94

Referee for *American Economic Review*, *Econometrica*, *Economic Inquiry*, *Economic Journal*, *Economics of Innovation and New Technology*, *Journal of Applied Econometrics*, *Journal of Economics Organization and Management*, *Journal of Environmental Economics and Management*, *Journal of Health Economics*, *Journal of Industrial Economics*, *Journal of Law and Economics*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Rand Journal of Economics*, *Research Policy*, *Review of Economics and Statistics*, *Science*, and MIT Press.

TEACHING EXPERIENCE

Introductory Economics (undergraduate), Microeconomic Theory (Ph.D.), Environmental and Natural Resource Economics (undergraduate), Industrial Organization (Ph.D. and undergraduate), Government Regulation and Antitrust Policy (Ph.D.), Applied Welfare Economics (John F. Kennedy School of Government), R&D, Innovation and Productivity Growth (undergraduate), Research Seminar in Industrial Organization (undergraduate), Research Seminar in Applied Microeconomics (undergraduate), Economics Head Tutor and Course Head, Sophomore Tutorial

Designed and implemented a two-year Policy Analysis Lecture Series for the U.S. Army Corps of Engineers, New England Division, Regulatory Branch (1988-89)

HONORS AND AWARDS

Research Associate, 1994-present, and Faculty Research Fellow, 1985-1994, National Bureau of Economic Research

Co-Principal Investigator, U.S. Department of Energy Grant, "The Effects of Government Policies on the Invention, Innovation, and Diffusion of Energy-Efficient Technologies," 1998-2001.

Co-Principal Investigator, U.S. Department of Energy Research Grant, "Energy-Efficiency Innovation and the Economic and Regulatory Environment," 1995-1998

Project Director, National Science Foundation Research Grant, "Using Patent Citation Data to Trace Knowledge Flows," 1994-97

Project Director, National Science Foundation Research Grant, "The Sources and Effects of Knowledge Spillovers," 1994-97

Invited Speaker, National Academy of Sciences Symposium: *Science and the Economy*, April 1994

Co-Principal Investigator, National Science Foundation Research Grant, "Getting Down to Basics: Using University and Corporate Patents to Identify Basic Inventions and Trace Their Diffusion," 1991-92

Co-Principal Investigator, Environmental Protection Agency Exploratory Research Grant, "Evaluating the Relative Effectiveness of Economic Incentives and Direct Regulation for Environmental Protection: Impacts on the Diffusion of Technology," 1991-93

Alfred P. Sloan Dissertation Fellowship, Harvard, 1984-85

Alfred P. Sloan Research Fellowship, MIT, 1976-77

Phi Beta Kappa, 1976

Appendix B: Data and Methodology for Over-the-Air Broadcaster Benchmark

1. Data Sources

Musical works royalty for over-the-air broadcasters

Since there was not a publicly available source for fees paid by over-the-air radio stations to ASCAP, BMI, and SESAC, we undertook to collect this information from broadcasters that represent a significant fraction of radio stations in the United States. From each broadcaster, we asked for the total musical works royalties paid by each station in 2000 to ASCAP, BMI, and SESAC, as well as for information on the type of license (blanket or per-program). We requested and received data from Bonneville International Corporation, CBS Broadcasting, Inc., Clear Channel Communications, Inc., Crawford Broadcasting Company, Emmis Communications, Entercom Communications Corporation, Salem Communications Corp., Susquehanna Pfaltzgraff Co., and The Walt Disney Company/ABC, Inc.

For each station we were provided with information on the fees paid to ASCAP, BMI, and SESAC. ASCAP and BMI fees are based on licenses signed between each station and ASCAP or BMI. Some of the broadcasters had group-wide deals with SESAC. In those cases, we relied on the breakdown of the SESAC fee by station that was provided to us by the broadcaster.

For most stations, the royalties covered the 12 months corresponding to fiscal year 2000. However, some of the fee data covered less than the full year, if, for example, a station was acquired or sold during the year.

Listener-hour data

The listener hours for each station are calculated from Arbitron broadcast radio ratings. One measure of listening audience, "average quarter hour persons" (AQH persons), is converted into an annual listener-hour number. "AQH persons" is defined as the average number of persons listening to a particular station for at least five minutes during a 15-minute period. AQH persons were converted into annual listener hours by multiplying AQH persons by the hours broadcast per day times days per year. For most stations, the calculation of annual listener hours was average AQH for 2000 times 18 hours per day times 365 days per year. If fee data were available for less than a full year, the listener hours were adjusted to correspond with the same time period as the available fee data.

Specifically, the measure of AQH persons that we used was based on the DMA definition of the market for people ages 12+ during the time period 6 am to 12 midnight. A DMA, or Designated Market Area, is composed of counties. Every county in the U.S. is assigned exclusively to one DMA. Since our goal is to get a listener-hour number for a large group of stations, we used this market definition to avoid double-counting. To account for possible seasonality, AQH persons from the spring of 2000 and the fall of 2000 were averaged.

To be reported by Arbitron, a station must engage in systematic regular commercial broadcasting, and it must have a minimum amount of listenership.¹ AQH persons were aggregated across all markets in which Arbitron reported ratings.

Program format

Data on the format of the programming of each station came from BIA Financial Network, a source of data on the radio industry.

Songs per hour

For the calculation of the over-the-air musical work royalty per listener song, we needed data on the number of songs played per hour on broadcast radio. To implement this model, we relied on data from Broadcast Data Systems (BDS) on the average songs per hour by program format. BDS collects information on the play lists of close to 1,000 stations, using its unique digital technology to identify specific songs. A by-product of its analysis is data on the number of songs per hour.² For each station in the eleven music-intensive formats that BDS tracks, we assigned the station an average number of songs per hour from BDS data for 2000 based on its format. Exhibit B-1 summarizes the songs per hour by format used in our analysis.

2. Description of Calculations

Stations were included in the analysis if (1) the station-reported performing rights society fee was complete for all three societies and greater than zero;

¹ Specifically, the station must have a DMA AQH rating of at least .05 and a DMA Cume Rating of at least .495, and at least ten DMA diaries must report at least five minutes of listening in a quarter-hour.

² BDS is a leading provider of off-the-air music recognition for the record and radio industries. BDS uses a computer technology to monitor radio broadcasts and to determine what songs are played on the air.

(2) the station had a blanket license; and (3) Arbitron reported AQH persons for at least one of the two reporting periods in 2000.

Exhibit B-2 summarizes the calculation of the over-the-air broadcaster fees per listener hour and per listener song.

The average fee per listener hour is \$0.0022. This number is calculated by dividing total ASCAP/BMI/SESAC fees by total annual listener hours. As summarized in Exhibit B-2, for the listener-hour model we have data from 898 stations representing \$143.2 million in fees that are paid to the performing rights organizations. These stations represent 65.3 billion listener hours.

The average fee per listener song is \$0.00020. This number is calculated by dividing total ASCAP/BMI/SESAC fees by total listener songs. Listener songs is calculated for each station by multiplying the listener hours by the average number of songs per hour. Total listener songs is the sum of listener songs from each station in the sample. For certain formats (whose stations represent less than 4% of total listener hours), BDS does not report average songs per hour, and I removed those stations from the calculation of fee per listener song. As summarized in Exhibit B-2, for the listener-song model we have data from 858 stations representing \$141.2 million in fees that are paid to the performing rights organizations. These stations represent 714.6 billion listener songs.

Exhibit 1

SOUND RECORDING ROYALTY AS A FRACTION OF MUSICAL WORK ROYALTY BY COUNTRY

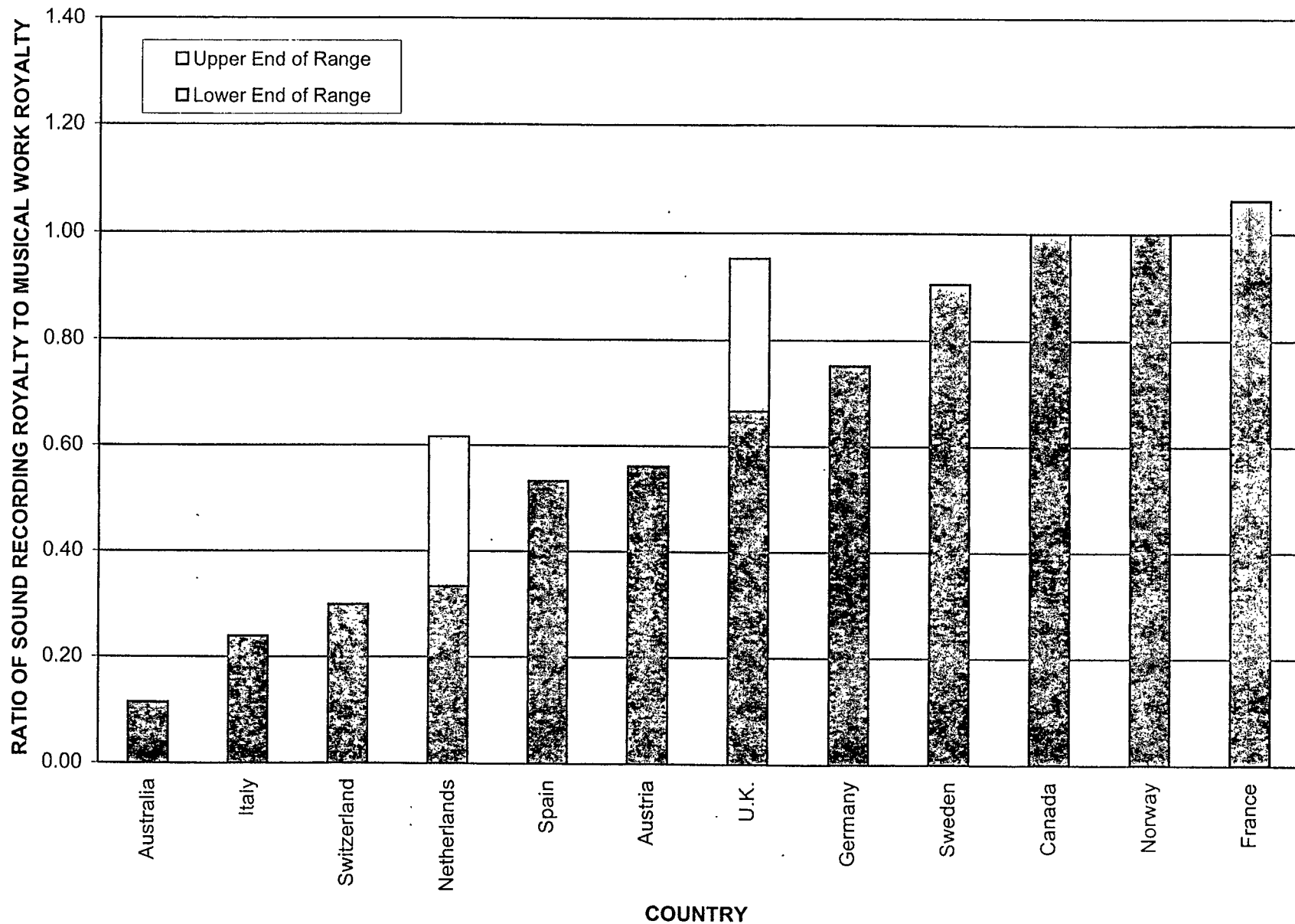


Exhibit 2

**COMPARISON OF PROMOTIONAL VALUES TO MUSICAL WORKS
AND SOUND RECORDINGS FROM OVER-THE-AIR RADIO**

STEP 1:	Estimate Promotional Value to Composers	\$156,886,083
STEP 2:	Estimate Royalties to Composers	<u>\$342,679,297</u>
STEP 3:	Estimate Total Value to Composers	<u>\$499,565,380</u>
STEP 4:	Estimate Promotional Value to Record Labels	\$321,883,539
STEP 5:	Estimate Implied Royalty to Record Labels	\$177,681,842
STEP 6:	Estimate Ratio of Implied Sound Recording Royalty to Musical Work Royalty	0.52

Sources:

Recording Industry Association of America's 2000 Yearend Statistics: http://www.riaa.org/pdf/year_end_2000.pdf

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ASCAP/BMI/SESAC fee data for sample of radio stations

Exhibit B-1

AVERAGE SONGS PER HOUR BY FORMAT

Format	Average Songs Per Hour
Adult Album Alternative	9.18
Adult Contemporary	11.22
Album Oriented	9.46
Country & Western	12.29
Lite	10.74
Modern Rock	10.88
Oldies	13.80
Rhythm & Blues	9.25
Spanish	7.08
Top Forty	11.64

Source: BDS (Broadcast Data Systems) Average Detects per Hour per Radio Station for 2000

Exhibit B-2
SUMMARY OF OVER-THE-AIR BROADCASTER FEES

Fee per Listener Hour	\$0.0022
Fee per Listener Song	\$0.00020

Listener Hour Model

Number of Stations	898
Total ASCAP/BMI/SESAC Fees FY00	\$143,210,523
Total Listener Hours	65,333,692,800

Listener Song Model

Number of Stations	858
Total ASCAP/BMI/SESAC Fees FY00	\$141,172,922
Total Listener Songs	714,556,526,202

Sources:

ASCAP/BMI/SESAC fee data for sample of radio stations

Listener Hours: Calculation from Arbitron Spring 2000 and Fall 2000 data

Songs per Hour: BDS Average Detects per Hour per Radio Station for 2000